

**Sampling Results for the Conditional Waiver for Irrigated Agriculture  
Monitoring Program – Central Valley Regional Water Quality Control  
Board**

**Quarterly Report – Activities from January 1, 2005 – March 31, 2005**

**Prepared for the Central Valley Regional Water Quality Control Board**

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## DESCRIPTION OF THE STUDY AREA AND THE SAMPLING PLAN

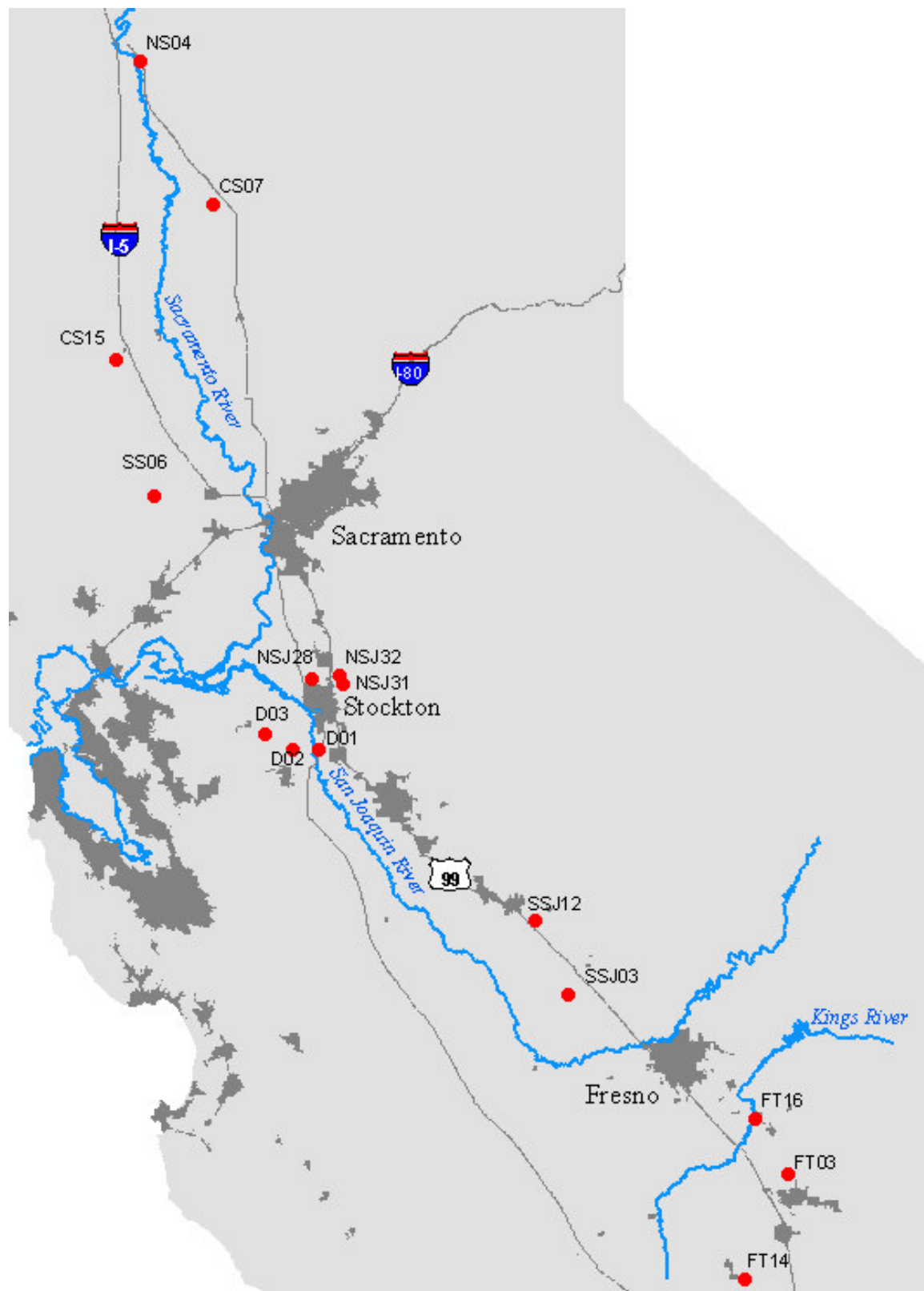
Fifteen sampling sites were chosen for the Dormant Season 2004 / 2005 Monitoring Phase II Agricultural Waiver Program from Red Bluff to the Tulare Basin (Table 1, Figure 1).

**Table 1.** Sites sampled during the 2005 dormant season. Site ID is used throughout the report to refer to the specific sites.

Site ID	Site Name	Latitude	Longitude	County
CS07	Butte Creek on Durham Dayton Hwy	39.64593	-121.78492	Butte
CS15	Spring Creek at Walnut Drive	39.11975	-122.19318	Sutter
D01	Drain to San Joaquin River off south Manthey Road	37.82340	-121.29850	Merced
D02	Drain to Grant Line Canal off Wing Levee Road	37.82050	-121.40350	Merced
D03	Drain to North Canal at south Bonetti Road	37.87150	-121.52560	Merced
FT03	Elbow Creek on Rd 112 N of Visalia	36.40293	-119.32213	Tulare
FT14	Tule River at Popular Ave	36.05001	-119.50499	Tulare
FT16	Kings River at Reed Ave	36.58692	-119.45639	Fresno
NS04	Antelope Creek at Kansas Avenue	40.12483	-122.11470	Tehama
NSJ28	Pixley Slough at Eightmile Rd	38.05765	-121.31350	San Joaquin
NSJ31	Calaveras River at Pezzi Rd	38.04536	-121.19982	San Joaquin
NSJ32	Bear Creek at Alpine Rd	38.07402	-121.21093	San Joaquin
SS06	Winters Canal at Road 86A	38.66366	-122.01609	Yolo
SSJ03	Berenda Creek near intersection of Rd 17 and Ave 17.5	37.00448	-120.23746	Madera
SSJ12	Duck Slough at Arboleda Drive	37.25734	-120.37818	San Joaquin

The goal of the sampling program was to collect storm water runoff during two storm events during the dormant spray season. Each storm was to be sampled for four consecutive days at each site provided flows remained elevated. Due to the size of the water body, the daily sampling frequencies varied between one and three samples. Sites CS07, CS15, FT03 and SSJ03 were sampled three times a day with a minimum of four hours between sampling events. NSJ28 and NSJ31 were sampled twice each day with a minimum of six hours between sampling events. The remaining sites were sampled once a day. Depending on the surrounding crops, the sites were monitored for different constituents (Table 2). Additional sampling was conducted after each storm when the hydrograph returned to near normal. After storm sampling was conducted once or twice with a sampling frequency of once a day.

**Map 1.** Dormant Season 2004 / 2005 sampling sites



**Table 2.** Dormant Season 2004 / 2005 sampling details

Site ID	Site Name	Crops <sup>1</sup>	Monitoring Consituents <sup>2</sup>	Sampling frequency / day	No of Samples per Storm Event	No of Storm Events	Total No of Storm Samples <sup>3</sup>	Total No of after Storm Samples <sup>3</sup>	Total Number of samples
CS07	Butte Creek on Durham Dayton Hwy	O	T, OP, P, OC, WQ	3	12	2	24	4	28
CS15	Spring Creek at Walnut Drive	O, F	T, M, OP, P, OC, WQ	3	12	2	24	4	28
D01	Drain to San Joaquin River off south Manthey Road	F	OP, M, P, OC, WQ	1	4	2	8	4	12
D02	Drain to Grant Line Canal off Wing Levee Road	O, F	T, M, OP, P, OC, WQ	1	4	2	8	4	12
D03	Drain to North Canal at south Bonetti Road	F, G	M, OP, P, OC, WQ	1	4	2	8	4	12
FT03	Elbow Creek on Rd 112 N of Visalia	O, F	T, OP, P, OC, WQ	3	12	2	24	4	28
FT14	Tule River at Popular Ave	F	OP, H, P, OC, WQ	1	4	2	8	4	12
FT16	Kings River at Reed Ave	F, V	OP, H, P, OC, WQ	1	4	2	8	4	12
NS04	Antelope Creek at Kansas Avenue	O	T, OP, P, OC, WQ	1	4	2	8	4	12
NSJ28	Pixley Slough at Eightmile Rd	F, G, V	M, H, P, OP, OC, WQ	2	8	2	16	4	20
NSJ31	Calaveras River at Pezzi Rd	O, F	T, OP, P, OC, WQ	2	8	2	16	4	20
NSJ32	Bear Creek at Alpine Rd	V, G	H, OP, P, OC, WQ	1	4	2	8	4	12
SS06	Winters Canal at Road 86A	O	T, OP, OC, P	1	4	2	8	4	12
SSJ03	Berenda Creek near intersection of Rd 17 and Ave 17.5	O, F, V	T, H, OP, P, OC, WQ	3	12	2	24	4	28
SSJ12	Duck Slough at Arboleda Drive	O, F	T, M, OP, P, OC, WQ	1	4	2	8	4	12

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<sup>1</sup> O - orchards, F - field crops (tomatoes, cotton, vegetables), G - grains, V - vineyards

<sup>2</sup> T - water column toxicity, OP - organophosphorus, M - metals, WQ - water quality, H - herbicides, P- pyrethroids, OC-organochlorin

<sup>3</sup> Toxicity samples will be collected twice during each storm event on day one and day three. If toxicity is found, one more toxicity sample will be collected during after storm sampling. After storm sampling in general will be done once a day on two days.

## DESCRIPTION OF STORM EVENTS AND STORM SAMPLING

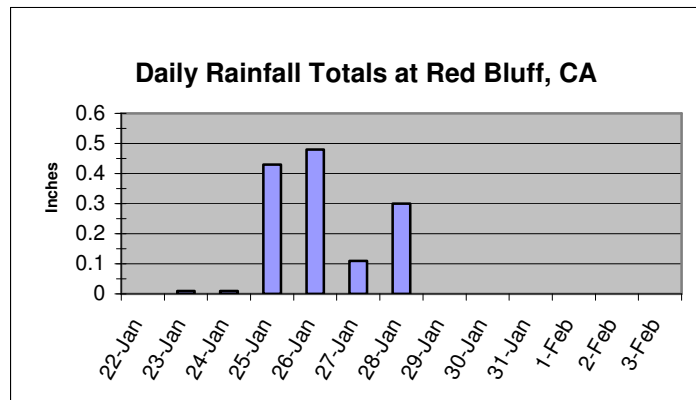
### Storm Event 1

The sites were divided among six sampling teams and storm sampling was initiated according to the rainfall patterns within broad geographic regions. All weather information was gathered from [www.nws.noaa.gov](http://www.nws.noaa.gov), <http://www.weatherunderground.com>, and <http://www.ipm.ucdavis.edu>. The first storm sampling occurred in late January after a dry period of about 12 days. A series of weather systems moved into California from across the Pacific causing periods of precipitation in the northern valley from January 25 through January 28. Total rainfall for this storm event was 1.53 inches at Red Bluff and 0.68 inches at Durham. The heaviest rainfall in the northern valley occurred on January 25, 26 and 28. No rain fell at either weather monitoring location between January 29 and February 3. Sites NS04, CS07, CS15, and SS04 were sampled from the morning of the 26<sup>th</sup> of January through the 29<sup>th</sup> of January.

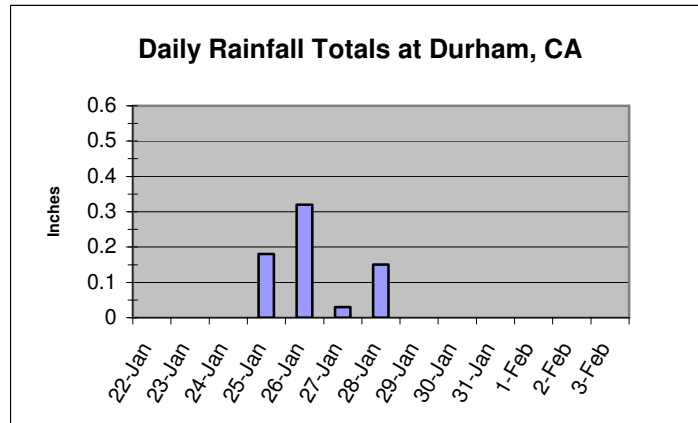
**Table 3.** Precipitation in inches at Red Bluff and Durham.

	Jan 22	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29
Red Bluff	0.00	0.01	0.01	0.43	0.48	0.30	0.30	0.00
Durham	0.00	0.00	0.00	0.18	0.32	0.03	0.15	0.00

**Figure 1.** Daily Rainfall Totals at Red Bluff, CA



**Figure 2.** Daily Rainfall Totals at Durham, CA

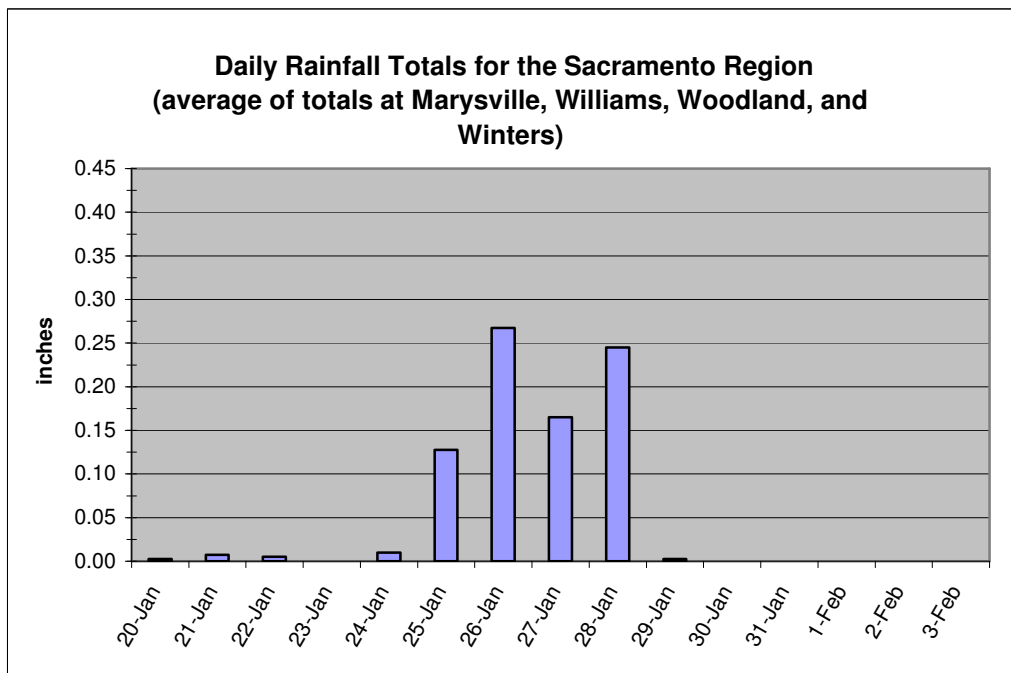


For the Sacramento region rainfall totals over this four-day period (1/25/05-1/28/05, Figure 3, Table 4) were 0.93 inches at Marysville, 0.73 inches at Williams, 0.47 inches at Woodland and 1.09 inches at Winters. No measurable rain fell at any site from January 29 through February 3.

**Table 4.** Precipitation in inches at Marysville, Williams, Woodland and Winters.

	Jan 25	Jan 26	Jan 27	Jan 28
Marysville	0.03	0.39	0.07	0.44
Williams	0.24	0.20	0.17	0.12
Woodland	0.03	0.18	0.12	0.14
Winters	0.21	0.30	0.30	0.28

**Figure 3.** Daily Rainfall Totals for the Sacramento Region, CA



Stockton experienced a rainfall total of 1.21 inches over the course of the 5-day storm event (Table 5).

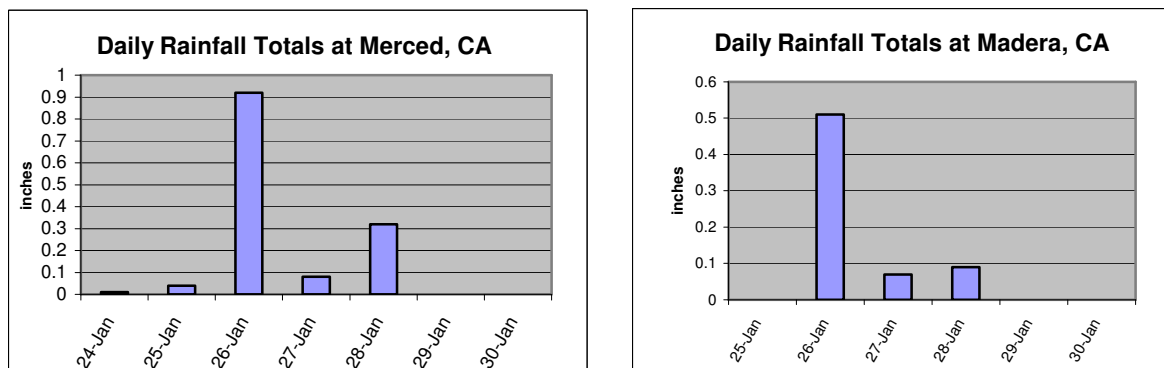
**Table 5.** Precipitation in inches at Stockton.

	Jan 23	Jan 24	Jan 25	Jan 26	Jan 27	Jan 28	Jan 29	Jan 30
Stockton	0	0.01	0.01	0.81	0.04	0.34	0	0

A small amount of rain fell in the Stockton area on the 25<sup>th</sup> of January. Sampling was initiated on January 26 at the Delta sites D01, D02, and D03 and on January 27 at NSJ28, NSJ31, and NSJ32. Sampling at the Delta sites continued through January 29, and through January 30 at the north San Joaquin sites.

Precipitation in the area near Merced during this storm reached 1.36 inches with most of the rainfall (0.92 inches) occurring on January 26, 2005. January 28 was the other day of significant rainfall (0.32 inches) (Figure 4). The weather pattern for Madera was similar to the Merced area, however less rainfall occurred. The precipitation total for the Madera during this storm reached 0.67 inches, which is about half the rainfall total of Merced.

**Figure 4.** Daily Rainfall Totals for Merced and Madera, CA



Fresno and Tulare counties received an average of 1.28 inches of rain exclusively on January 28. The largest total precipitation was measured at the city of Reedley.

**Table 6.** Precipitation in inches at Reedley and Visalia.

	Jan 27	Jan 28	Jan 29	Jan 30
Reedley	0.00	1.81	0.00	0.00
Visalia	0.00	0.76	0.00	0.00

Sampling at sites SSJ03, SSJ12, FT03, FT14 (FT17) and FT16 was initiated on January 27 and continued through January 30.

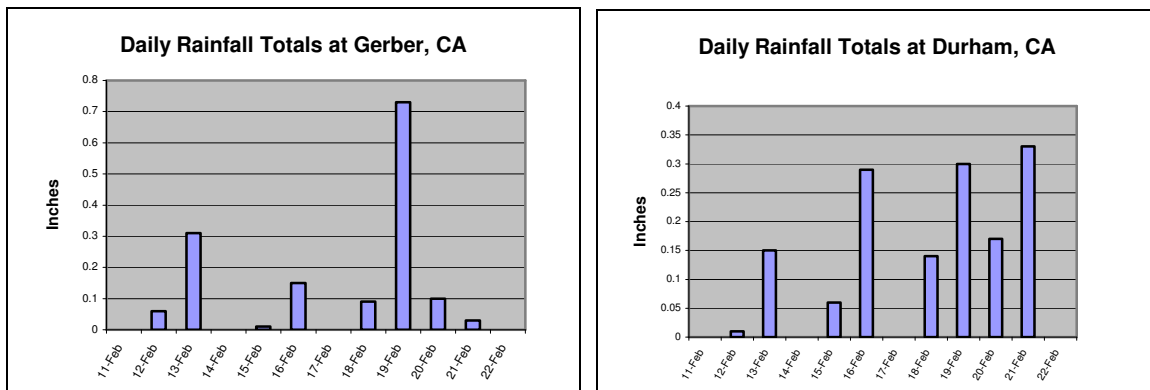
After storm sampling for the first storm was conducted on day six and day nine after the beginning of sampling. No rain fell during the after storm sampling at any site.

## Storm Event 2

The **second storm** occurred mid February when an upper level low swept up from Baja and became stagnant over Central California to the Central Rockies. This system brought rain to most of California.

In the northern Sacramento Valley most of the rain fell in the foothills and in the west side of the valley, while scattered showers occurred at the east edge of the valley floor. The storm event brought precipitation to sites NS04 and CS07 from February 12-21 after a dry period of 14 days. Precipitation in these areas was light and scattered. Total rainfall for this event was 1.45 inches at Durham (near CS07) and 1.48 inches at Gerber (near NS04) over 10 days (Figure 5).

**Figure 5.** Daily rainfall totals for Gerber and Durham.



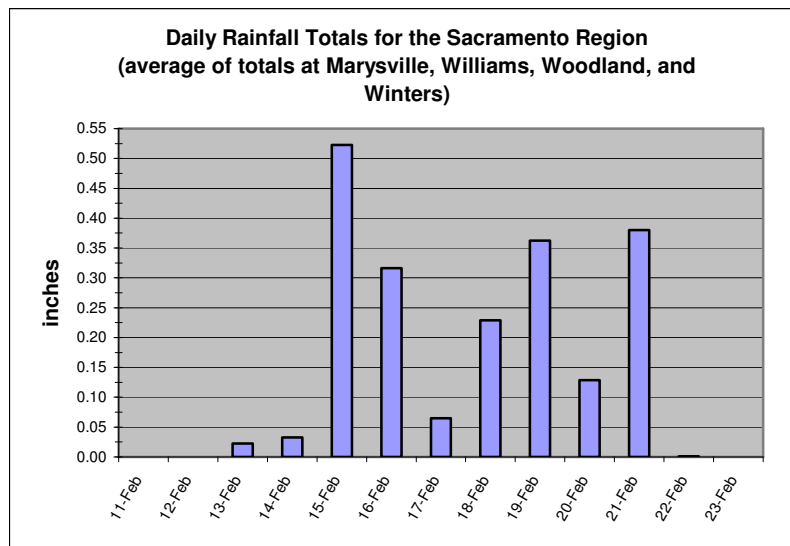
Sampling was initiated at NS04 on February 16 but terminated after the first sample was collected because the hydrograph failed to rise. Sampling at CS07 was performed on February 16 and 20, one time each day. The site was not sampled on the 17<sup>th</sup> because the water level had not increased. Sampling was conducted on the morning of February 20 when the site experienced increasing discharge. The discharge reached a peak later on that day and declined. After-storm sampling was cancelled for this site.

The storm brought rain to the Sacramento region from February 15 through February 21 (Table 7, Figure 6). The storm was preceded by a dry period of 16 days. Rainfall totals for the 7-day period were 1.79 inches at Marysville, 1.23 inches at Williams, 1.99 inches at Woodland and 3.23 inches at Winters. Sampling at CS15 occurred from February 16 through February 19, and at SS06 from February 16 through February 18. After storm sampling for CS15 was conducted on February 23 only and was cancelled for SS06.

**Table 7.** Precipitation in inches at Marysville, Williams, Woodland and Winters.

	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21
Marysville	0.24	0.54	0.00	0.14	0.37	0.04	0.42
Williams	0.11	0.20	0.00	0.27	0.21	0.02	0.36
Woodland	0.67	0.19	0.15	0.19	0.37	0.14	0.19
Winters	1.07	0.34	0.11	0.32	0.50	0.32	0.55

**Figure 6.** Daily Rainfall Totals for the Sacramento Region.



The second storm deposited 1.31 inches of rain in the Stockton area (Table 8, Figure 7). Most of the rain fell on February 15 and 18 (0.99 inches). Sampling started in the Stockton area on February 15. The three Delta sites were sampled on February 15 and 16 only due to stagnant water conditions at those sites. Sampling at the sites NSJ28, NSJ31 and NSJ32 was conducted from February 15 through February 17, but was cancelled for the fourth day of storm sampling due to the falling hydrograph at the three sites. After storm sampling was cancelled for all sites.

**Table 8.** Precipitation in inches at Stockton.

	Feb 15	Feb 16	Feb 17	Feb 18	Feb 19	Feb 20	Feb 21
Stockton	0.75	0.13	0.01	0.24	0.11	0.02	0.05

**Figure 7.** Daily Rainfall Totals for the Stockton Region, CA

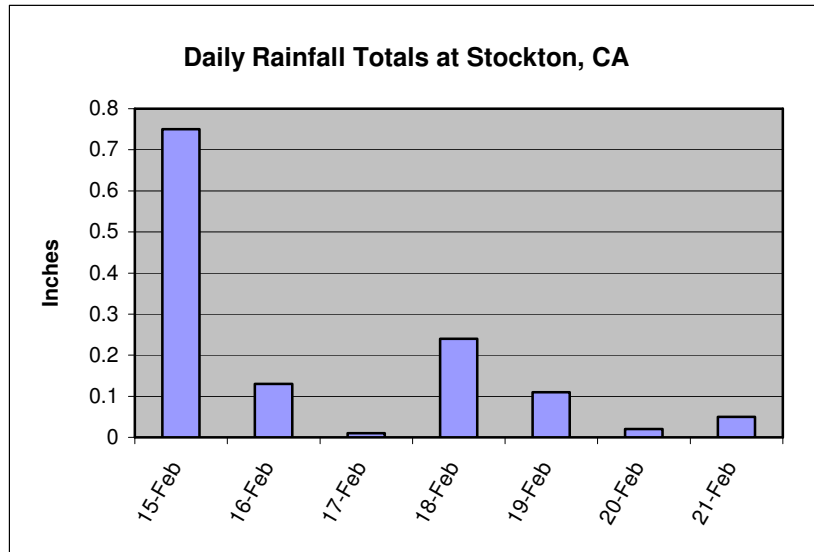


Table 9 summarizes the sampling for the dormant season 2005. Storm one was sampled as planned for all the 15 sites with four days of storm sampling and two days of after storm sampling. The second storm was cancelled for the sites SSJ03, SSJ12, FT03, FT14 and FT16 due to the end of the dormant spray period in their area. The sampling length for the second storm and for the rest of the sites was determined by the weather and hydrograph conditions. The sampling continued as long as the water levels stayed elevated and was cancelled with the falling of the hydrograph. “After storm samples” were only collected for sites that showed water column toxicity hits during the second storm.



**Table 9.** Sampling summary for the Phase II Dormant Season 2004 / 2005

Site ID	Storm 1 (depending on frequency once, twice or three times a day for 4 days)				After storm event (two samples taken once a day)		Storm 2 (depending on frequency once, twice or three times a day for 4 days)				After storm event (two samples taken once a day)		
	1	2	3	4	1	2	1	2	3	4	1	2	
NS04	1	1	1	1	1	1	1	NA <sup>4</sup>	NA <sup>4</sup>	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	7
CS07	2 <sup>1</sup>	3	3	3	1	1	1	1	NA <sup>4</sup>	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	15
CS15	3	3	3	3	1	1	2	2	1	1	1	NA <sup>5</sup>	21
SS06	1	1	1	1	1	1	1	1	1	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	9
D01	1	1	1	1	1	1	1	1	NA <sup>4</sup>	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	8
D02	1	1	1	1	1	1	1	1	NA <sup>4</sup>	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	8
D03	1	1	1	1	1	1	1	1	NA <sup>4</sup>	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	8
NSJ28	2	2	2	2	1	1	2	2	NA <sup>4</sup>	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	14
NSJ31	2	2	2	2	1	dry	2	2	2	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	15
NSJ32	1	1	1	1	1	1	1	1	1	NA <sup>4</sup>	NA <sup>5</sup>	NA <sup>5</sup>	9
SSJ03	3	3	3	3	1	1	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	14
SSJ12	1	1	1	1	1	1	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	6
FT03	2 <sup>1</sup>	3	3	3	1	1	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	13
FT14	FT17 <sup>2</sup>	FT17 <sup>2</sup>	1	1	1	1	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	4
FT16	1	1	1	1	1	1	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	NA <sup>3</sup>	6
15													157

<sup>1</sup> Site could only be sampled twice on the first day before darkness

<sup>2</sup> Site FT17 (Cross Creek at Hwy 99) was not sampled due to dangerous traffic conditions, alternative Cross Creek location appeared to be dry on storm day one and two. Alternative sampling site FT14 was picked up on day three of the storm

<sup>3</sup> Sites SSJ03, SSJ12, FT03, FT14, FT16 were not sampled during and after the second storm

<sup>4</sup> Sites were not sampled on those days due to changing storm conditions and falling hydrographs

<sup>5</sup> After storm samples were only collected at sites where Water Column Toxicity was found during the second storm

## METHODS

### FIELD METHODS

Discrete water samples were collected for analysis of various pesticides, metals and nutrients, of toxicity and of physical parameters (Table 10)

**Table 10.** Summary of Sample Container, Volume, Initial Preservation and Holding Time Recommendations for Water and Sediment Samples

Parameters for Analysis in WATER Samples	Recommended Containers (all containers pre-cleaned)	Typical Sample Volume (ml)	Initial Field Preservation	Maximum Holding Time (analysis must start by end of max)
<b>Physical Parameters<sup>1</sup></b>				
Color	1 liter glass or polyethylene	500 ml	Cool to 4°C, dark	48 hours at 4°C, dark
Turbidity	“	150 ml	”	48 hours at 4°C, dark
Total Dissolved Solids (TDS)	“	1000 ml	”	7 days at 4°C, dark
<b>Nutrients<sup>1</sup></b>				
Ortho-phosphate (O-PO <sub>4</sub> )	Trace clean and certified polyethylene	100 ml	Cool to 4°C, dark	48 hours at 4°C, dark
Nitrate + Nitrite (NO <sub>3</sub> + NO <sub>2</sub> )	“	150 ml	“	Recommend 48 hours at 4°C, dark <u>or</u> If preserved, H <sub>2</sub> SO <sub>4</sub> pH<2 28 days, either one at 4°C, dark
Nitrite (NO <sub>2</sub> )	“	150 ml	“	48 hours at 4°C, dark
Total Kjeldahl Nitrogen (TKN)	“	600 ml	“	Recommend 48 hours at 4°C, dark <u>or</u> If preserved, H <sub>2</sub> SO <sub>4</sub> pH<2 Recommend: 7 days Maximum: 28 days Either one at 4°C, dark
Ammonia (NH <sub>3</sub> )	“	500 ml	”	Recommend 48 hours at 4°C, dark <u>or</u> If preserved, H <sub>2</sub> SO <sub>4</sub> pH<2 Recommend: 7 days Maximum: 28 days Either one at 4°C, dark
(1) NOTE: The volume of water necessary to collect in order to analyze for the above constituents is typically combined in multiple 1-liter polyethylene bottles, which also allows enough volume for possible re-analysis and for conducting lab spike duplicates. This is possible since the same laboratory is conducting all of the above analyses; otherwise, individual volumes apply.				

**Table 10.** Summary of Sample Container, Volume, Initial Preservation, and Holding Time Recommendations for Water Samples (Continued)

Parameters for Analysis in WATER Samples	Recommended Containers (all containers pre-cleaned)	Typical Sample Volume (ml)	Initial Field Preservation	Maximum Holding Time (analysis must start by end of max)
<b>TOC and THMs in Drinking Water and Surface Water</b>				
Total Organic Carbon (TOC)	40 ml glass vial	40 ml (one vial)	Cool to 4°C, dark	28 days at 4°C, dark
<b>Trace Elements in Water Samples</b>				
TOTAL ELEMENTS (As, B, Cd, Cu, K, Ni, P, Pb, Se, Zn)	60 ml polyethylene bottle, pre-cleaned in lab using HNO <sub>3</sub>	60 ml (one bottle)	Cool to 4°C, dark. Acidify in lab within 48 hrs, with ultra-pure HNO <sub>3</sub> for pH<2.	Once sample is acidified, can store up to 6 months at room temperature
HARDNESS	200 ml polyethylene or glass bottle	200 ml (one bottle)	Cool to 4°C, dark	48 hours at 4°C, dark
<b>Synthetic Organic Compounds in Water Samples</b>				
PESTICIDES & HERBICIDES* <input type="checkbox"/> Organophosphate Pesticides <input type="checkbox"/> Organochlorine Pesticides <input type="checkbox"/> Carbamates <input type="checkbox"/> Pyrethroids <input type="checkbox"/> Herbicides	1-L I-Chem 200-series certified trace clean amber glass bottle, with Teflon lid-liner (per each sample type)	1000 ml (one container)  *Each sample type requires 1000 ml in a separate container	Cool to 4°C, dark  If chlorine is present, add 0.1g sodium thiosulfate	Keep at 4°C, dark, up to 7 days. Extraction must be performed within the 7 days; analysis must be performed within 40 days of extraction.
<b>Toxicity Testing - Water Samples</b>				
TOXICITY IN WATER	Four 2.25 L I-Chem 200-series certified amber glass bottles	9000 ml	Cool to 4°C, dark	36 hours at 4°C, dark

The samples were collected following the Standard Operating Procedures included in the Quality Assurance Project Plan developed for the Agricultural Waiver Monitoring Program. The samples were put on ice immediately after collection. The Water Column Toxicity samples were delivered to AQUA-Science Laboratory, the TOC samples to the UC Davis Department of Civil and Environmental Engineering and the metals samples to the Department of Fish & Game Marine Pollution Studies Laboratory in Moss Landing. All other samples were analyzed at the Department of Fish and Game Fish and Wildlife Water Pollution Control Laboratory in Rancho Cordova.

Temperature, pH, conductivity (EC) and dissolved oxygen (DO) were measured using Oakton\* pH/Con 10 Multiparameter Meter and Fisherbrand\* Traceable\* Dissolved Oxygen Meter. Field measurements, weather and water conditions were noted on field sheets as well as the sampling time, the number of collected samples and quality control samples.

Velocity was measured with a USGS Price Type AA Current Meter for normal velocities by wading if the stream flow exceeded the rating limit of the meter (Table 11).

**Table 11. Summary of the discharge in ft<sup>3</sup>/s measured during the Dormant Season 2004 / 2005**

Sample Period	Site ID	NSJ28 (cfs)	NSJ31 (cfs)	NSJ32 (cfs)	NS04 (cfs)	CS07* (cfs)	CS15 (cfs)	SS06 (cfs)	FT16** (cfs)
<b>Strom 1</b>	1/26/2005				21.32	416	2.23	1.41	
	1/26/2005					821	2.48		
	1/26/2005						1.50		
	1/27/2005	NA	NA	NA	NA	1277	NA	NA	121
	1/27/2005	NA	NA			1192	NA		
	1/27/2005					1084	NA		
	1/28/2005	NA	NA	NA	NA	1262	NA	3.58	98
	1/28/2005	NA	NA			1457	NA		
	1/28/2005					1284	NA		
	1/29/2005	NA	NA	NA	NA	993	4.72	0.86	110
	1/29/2005	6.44	NA			938	3.28		
	1/29/2005					859	2.75		
	1/30/2005	3.29	23.85	NA					82
	1/30/2005	2.55	18.08						
<b>After Storm</b>	1/31/2005				NA	538	0.34	NA	
	2/1/2005	2.21	2.67	NA					82
	2/3/2005				NA	242	NA	NA	
	2/4/2005	0.27	Dry	NA					81
<b>Storm 2</b>	2/15/2005	2.36	6.69	6.04					
	2/15/2005	17.72	6.68						
	2/16/2005	29.83	8.77	75.7	25.29	326	0.73	10.25	
	2/16/2005	27.9	20.06				6.60		
	2/17/2005	C	17.09	94.6	C	C	4.09	NA	
	2/17/2005	C	15.29				2.72		
	2/18/2005	C	C	C	C	C	14.35	17.03	
	2/19/2005				C	C	NA	C	
	2/20/2005					732			
<b>After Storm</b>	2/23/2005	CA	CA	CA	CA	CA	10.37	CA	
		CA	CA	CA	CA	CA	CA	CA	

**Notes:**

NA = Discharge values are not available due to one of the following reasons:

- 1) Flow was too high for wading / bridge discharge equipment was not available due to

unexpected delays in the equipment delivery

2) No discharge equipment available due to malfunction and unexpected delays in the equipment delivery

3) Water level was too low to take a discharge measurement

CS07 \*= Discharge was obtained from CDEC gage BCD

FT16 \*\*= Discharge was obtained from the Kings River Water Association, values reflect mean daily flows, the gage is located approx. 16 miles upstream the sampling location

C = sampling was cancelled due to changing storm conditions and falling hydrographs

CA = After storm sampling was cancelled

Discharge was measured following the standard method described in USDA Technical Report RM-245. For velocity that was measured in a channel, the currently recommended mid-section method by the U.S. Geological Survey was used to compute discharge (Harrelson 1994). The failure to measure discharge with every sampling event was caused by the malfunction of some discharge equipment. The faulty equipment was returned to the manufacturer for repair and was not returned in time to obtain discharge measurements at all sites.

## ANALYTICAL METHODS

### *Organic Analytical Methods*

#### Volatile Organic Compounds (EPA 8260)

The volatile compounds were introduced into the gas chromatograph (GC) by the purge-and-trap method. Samples were transferred to a purge and trap sparger and purged with inert gas. The target analytes were trapped during the purge cycle on a Tenax trap. After the purge cycle was completed, the Tenax trap was heated and the analytes were introduced directly into a capillary column for analysis. The (GC) column was temperature-programmed to separate the analytes, which were then detected with a mass spectrometer (MS) interfaced to the gas chromatograph (GC). Analytes eluted from the capillary column were introduced into the MS via direct connection. Identification of target analytes was accomplished by comparing their retention time and mass spectra with the retention time and electron impact spectra of authentic standards. Quantitation was accomplished by comparing the response of a major (quantitation) ion relative to an internal standard using a five-point calibration curve.

### *Pesticide/herbicide Analytical Methods*

#### Sample Extraction for Organochlorines, Organophosphorus, Triazines, Selective Herbicides, and Pyrethroids – EPA 3510C

A measured volume of sample (1.0 L) was extracted with methylene chloride (DCM) using a separatory funnel (liq/liq technique). The DCM extract was dried with sodium sulfate, evaporated using a Kuderna-Danish (K-D) apparatus and solvent exchanged into petroleum ether. The extract was concentrated using a micro-snyder (micro K-D) apparatus to approximately 1.0 ml and finally adjusted to 2.0 ml with iso-octane.

#### Sample Preparation for Selective Herbicides – EPA 3535

A measured volume of sample (1.0 L) was acidified with sulfuric acid: DI water (1:1) to  $\text{pH} \leq 2$ , the acidified sample was then eluted through a pre-conditioned C18 (Sep-Pak) column. The target herbicides were eluted from the C18 column with 2.0 ml methanol.

#### Sample Preparation for Carbamates – EPA 3510CM

A measured volume of sample (1.0 L) was extracted with methylene chloride (DCM) using a separatory funnel. The DCM extract was dried with sodium sulfate, evaporated to almost dryness using rotary evaporator and finally adjusted to 2.0 ml with methanol.

### *Instrumentation Methods*

#### Organochlorines Pesticides – EPA 8081A

Organochlorines were analyzed using an Agilent 6890 plus, equipped with two micro ECD detectors, EPC split-splitless injector, Agilent auto-sampler and dual 60 meter capillary columns (DB5 and DB17)(0.25 mm ID and 0.25  $\mu\text{m}$  film thickness) connected to a single injection port using a “Y” fit connector.

#### Organophosphorus Pesticides – EPA 8141A

The samples were analyzed using an Agilent 6890 plus, equipped with two FPD detectors in phosphorous mode, EPC split-splitless injector, Agilent auto-sampler and dual 60 meter capillary columns (DB5 and DB17) (0.25 mm ID and 0.25  $\mu\text{m}$  film thickness) connected to a single injection port using a “Y” fit connector.

#### Triazines – EPA 619

Triazine herbicides were analyzed using a GC Varian 3600, equipped with two TSD detectors, 7890 injector, 8200 autosampler and dual 30 meter capillary columns (DB5 and DB17) (0.25 mm ID and 0.25  $\mu\text{m}$  film thickness) connected to a single injection port using a “Y” fit connector.

#### Selective Herbicides – EPA 1656M

Some herbicides were analyzed using an Agilent 1100 high performance liquid chromatograph/mass spectrometer (HPLC-MS) using atmospheric pressure electrospray ionization in negative and/or positive mode.

#### Glyphosate/AMPA – EPA 547

The samples were analyzed by direct injection using a Hewlett Packard 1100 HPLC equipped with post column derivatization, and fluorescence detector.

#### Pyrethroids – EPA 1660M

Pyrethroids were analyzed using an Agilent 6890 plus, equipped with two micro ECD detectors, EPC split-splitless injector, Agilent auto-sampler and dual 60 meter capillary columns (DB5 and DB17)(0.25 mm ID and 0.25  $\mu\text{m}$  film thickness) connected to a single injection port using a “Y” fit connector.

#### Carbamates – EPA 632M

Carbamates were analyzed by Agilent 1100 liquid chromatograph/mass spectrometer (HPLC-MS) using atmospheric pressure electrospray ionization in positive mode.

### *Inorganic Analytical Methods*

#### Trace Elements by ICP-MS – EPA 1638

Inductively coupled plasma-mass spectrophotometer was used in the analysis of water samples. No digestion was required prior to analysis for dissolved elements in water samples. The method measures ions produced by a radio frequency inductively coupled plasma. Analyte species originating in a liquid were nebulized and the resulting aerosol transported by plasma gas and introduced by means of an interface into a mass spectrometer. The ions produced in the plasma were sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier. Interferences were assessed and valid corrections applied or the data was flagged to indicate problems. Interference correction included compensation for background ions contributed by the plasma gas, reagents, and constituents of the sample matrix.

Samples were run with no dilution. Standard curves were run for all elements of concern. All samples, standards, SRM's, and blanks were made up in a 1-2 % Nitric acid solution. Blanks, standard reference materials, matrix spikes and calibration standards were run with all samples.

#### Ammonia – EPA 350.3

Ammonia was determined by use of an ion selective electrode (ISE) specific for the ammonium ion. The electrode used a hydrophobic, gas permeable membrane, which separated the sample from an internal ammonium chloride solution. The sample ammonia diffused through the membrane and adjusted the pH of the internal solution. This change was translated into a relative millivolt reading displayed on the pH/ISE meter.

#### Color - SM 2120B Mod

Color was determined using an automated colorimetric method equivalent to the visual comparison method, SM 2120B. Potassium hexachloroplatinate and cobalt(II) chloride hexahydrate were used to prepare the color standards. The samples and standards were buffered at pH 6.8 during analysis and the product read at 410nm. Because color is pH dependent, the pH at which color was determined was reported with results.

#### Ortho-phosphate – EPA 365.1 Mod

Ortho-phosphate was determined using an automated colorimetric method accomplished by flow injection analysis. The ortho-phosphate in the sample reacted with ammonium molybdate and antimony tartrate under acidic conditions. The product was then reduced by ascorbic acid to produce a blue color read at 880nm.

#### Nitrate + Nitrite as N – EPA 353.2

Nitrate plus nitrite was determined using an automated colorimetric method accomplished by flow injection analysis. The sample was passed through a cadmium column and the nitrate reduced to nitrite. The nitrite then reacted with sulfanilamide and N-(1-naphthyl)ethylenediamine dihydrochloride forming a pink color which was read at 520 nm.

#### TDS – SM 2540 C

A representative sample aliquot was filtered through a glass fiber filter. The filtrate was then evaporated in a pre-weighed dish and then dried to constant weight at 180°C. The difference between the final dish weight and initial dish weight represented the total dissolved solids.

#### Turbidity – SM 2130B

The method was based upon a comparison of the intensity of light scattered by a sample under defined conditions with the intensity of light scattered by a standard reference suspension of formazin.

#### Hardness – SM 2340C

Hardness was defined as the sum of the calcium and magnesium concentrations, both expressed as calcium carbonate in mg/L. The sample with Calmagite indicator was pink in color when buffered to pH 10.0. EDTA was added as the titrant, and the Calmagite complexes of calcium and magnesium dissociated to form their more stable EDTA complex. At the end point, the solution turns blue as a result of the dissociated Calmagite. The amount of EDTA used therefore provides a measure of calcium and magnesium in the water.

Table 12 summarizes the analytical methods and laboratory detection and reporting requirements for all the constituents except Water Column Toxicity.

### ***Toxicity Testing Methods***

AQUA-Science Laboratory conducted water column toxicity testing during the 2005 dormant season. Acute toxicity testing was conducted using the invertebrate *Ceriodaphnia dubia* and the larval fathead minnow *Pimephales promelas* according to standard USEPA (2002a) acute toxicity methods. In addition to identifying toxicity caused by herbicides, 96-hour tests with the green algae *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum*) were conducted according to standard USEPA (2002b) methods.

**Table 12. Laboratory Detection and Reporting Limit Requirements**

MediumName	MethodName	AnalyteName	FractionName	Units	ChemAgency Code	MDL	RL	INSTRUMENTATION
<b>GENERAL PARAMETERS</b>								
samplewater	SM 2120B Mod	Color	None	Color Units	DFG-WPCL	2.0	5.0	FIA
samplewater	SM 2130B	Turbidity	None	NTU	DFG-WPCL	1	1	Nephelometer
samplewater	SM 2540C	Solids	Total Dissolved	mg/L	DFG-WPCL	10	10	
samplewater	EPA 415.1	Organic Carbon	Total	mg/L	DFG-WPCL	0.2	0.5	
<b>PATHOGENS</b>								
samplewater	Quantitray	E Coli	None	MPN/100mL	Contract Lab			
<b>TRIHALOMETHANES (THM)</b>								
samplewater	EPA 8260	Chloroform	None	µg/L	DFG-WPCL	0.05	2	GC-MS/Purge and Trap
samplewater	EPA 8260	Bromoform	None	µg/L	DFG-WPCL	0.2	2	GC-MS/Purge and Trap
samplewater	EPA 8260	Dibromochloromethane	None	µg/L	DFG-WPCL	0.08	2	GC-MS/Purge and Trap
samplewater	EPA 8260	Bromodichloromethane	None	µg/L	DFG-WPCL	0.06	2	GC-MS/Purge and Trap
<b>TRACE ELEMENTS</b>								
samplewater	EPA 1638	Arsenic	Dissolved/Total	µg/L	MPSL-DFG	0.10	0.30	ICP-MS
samplewater	EPA 1638	Boron	Dissolved/Total	µg/L	MPSL-DFG	1	5	ICP-MS
samplewater	EPA 1638	Cadmium	Dissolved/Total	µg/L	MPSL-DFG	0.002	0.01	ICP-MS
samplewater	EPA 1638	Copper	Dissolved/Total	µg/L	MPSL-DFG	0.003	0.01	ICP-MS
samplewater	EPA 1638	Lead	Dissolved/Total	µg/L	MPSL-DFG	0.006	0.01	ICP-MS
samplewater	EPA 1638	Nickel	Dissolved/Total	µg/L	MPSL-DFG	0.006	0.02	ICP-MS
samplewater	EPA 1638	Phosphorous	Dissolved/Total	µg/L	MPSL-DFG	1.0	3.0	ICP-MS
samplewater	EPA 1638	Selenium	Dissolved/Total	µg/L	MPSL-DFG	0.10	0.30	ICP-MS
samplewater	EPA 1638	Zinc	Dissolved/Total	µg/L	MPSL-DFG	0.02	0.06	ICP-MS
<b>INORGANIC (CONVENTIONAL ANALYTES)</b>								
samplewater	EPA 350.3	Ammonia as N	None	mg/L	DFG-WPCL	0.04	0.1	ISE
samplewater	EPA 351.2	Nitrogen as N, Total Kjeldahl (TKN)	None	mg/L	DFG-WPCL	0.12	0.25	FIA
samplewater	EPA 353.2	Nitrate+nitrite as N	None	mg/L	DFG-WPCL	0.005	0.01	FIA
samplewater	EPA 353.2	Nitrite as N	None	mg/L	DFG-WPCL	0.005	0.01	FIA
samplewater	EPA 365.1Mod	Phosphate as P, Ortho	None	mg/L	DFG-WPCL	0.005	0.01	FIA
<b>ORGANOCHLORINE PESTICIDES</b>								
samplewater	EPA 608/8081A	DDD(o,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDD(p,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDE(o,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS

**Table 12. Laboratory Detection and Reporting Limit Requirements (Continued)**

MediumName	MethodName	AnalyteName	FractionName	Units	ChemAgency Code	MDL	RL	INSTRUMENTATION
samplewater	EPA 608/8081A	DDE(p,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDT(o,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDT(p,p')	None	µg/L	DFG-WPCL	0.002	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Dicofol	None	µg/L	DFG-WPCL	0.05	0.1	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Dieldrin	None	µg/L	DFG-WPCL	0.001	0.002	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Endrin	None	µg/L	DFG-WPCL	0.002	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Methoxychlor	None	µg/L	DFG-WPCL	0.001	0.002	GC-ECD/GC-MS
<b>HERBICIDES</b>								
samplewater	EPA 619	Atrazine	None	µg/L	DFG-WPCL	0.02	0.05	GC-NPD/GC-MS
samplewater	EPA 619	Cyanazine	None	µg/L	DFG-WPCL	0.02	0.05	GC-NPD/GC-MS
samplewater	EPA 547	Glyphosate	None	µg/L	DFG-WPCL	2.0	5.0	HPLC-FLUORESCENCE
samplewater	WPCL	Molinate	None	µg/L	DFG-WPCL	0.1	0.2	GC-NPD/GC-MS
samplewater	WPCL	Paraquat dichloride	None	µg/L	DFG-WPCL	0.2	0.5	HPLC-MS
samplewater	EPA 619	Simazine	None	µg/L	DFG-WPCL	0.02	0.05	GC-NPD
samplewater	WPCL	Thiobencarb	None	µg/L	DFG-WPCL	0.1	0.2	GC-NPD/GC-MS
<b>CARBAMATE PESTICIDES/HERBICIDES</b>								
samplewater	EPA 632 Mod	Aldicarb	None	µg/L	DFG-WPCL	0.01	0.05	HPLC-MS
samplewater	EPA 632 Mod	Captan	None	µg/L	DFG-WPCL	0.05	0.1	HPLC-MS
samplewater	EPA 632 Mod	Carbaryl	None	µg/L	DFG-WPCL	0.01	0.02	HPLC-MS
samplewater	EPA 632 Mod	Carbofuran	None	µg/L	DFG-WPCL	0.01	0.02	HPLC-MS
samplewater	EPA 632 Mod	Diuron	None	µg/L	DFG-WPCL	0.002	0.005	HPLC-MS
samplewater	EPA 632 Mod	Linuron	None	µg/L	DFG-WPCL	0.002	0.005	HPLC-MS
samplewater	EPA 632 Mod	Methiocarb	None	µg/L	DFG-WPCL	0.15	0.25	HPLC-MS
samplewater	EPA 632 Mod	Methomyl	None	µg/L	DFG-WPCL	0.01	0.02	HPLC-MS
<b>PYRETHROID PESTICIDES</b>								
samplewater	EPA 1660 Mod	Biphenethrin	None	µg/L	DFG-WPCL	0.005	0.01	GC-ECD/GC-MS
samplewater	EPA 1660 Mod	Cyfluthrin	None	µg/L	DFG-WPCL	0.005	0.01	GC-ECD/GC-MS
samplewater	EPA 1660 Mod	Cypermethrin	None	µg/L	DFG-WPCL	0.01	0.05	GC-ECD/GC-MS
samplewater	EPA 1660 Mod	Esfenvalerate/Fenvalerate	None	µg/L	DFG-WPCL	0.002	0.01	GC-ECD/GC-MS
samplewater	EPA 1660 Mod	Permethrin	None	µg/L	DFG-WPCL	0.01	0.02	GC-ECD/GC-MS
<b>ORGANOPHOSPHATE PESTICIDES</b>								
samplewater	EPA 8140,8141A	Azinphos-Methyl	None	µg/L	DFG-WPCL	0.03	0.05	GC-FPD
samplewater	EPA 8140,8141A	Chlorpyrifos	None	µg/L	DFG-WPCL	0.003	0.005	GC-FPD
samplewater	EPA 8140,8141A	Diazinon	None	µg/L	DFG-WPCL	0.003	0.005	GC-FPD

**Table 12. Laboratory Detection and Reporting Limit Requirements (Continued)**

MediumName	MethodName	AnalyteName	FractionName	Units	ChemAgency Code	MDL	RL	INSTRUMENTATION
samplewater	EPA 8140,8141A	Dimethoat	None	µg/L	DFG-WPCL	0.03	0.05	GC-FPD
samplewater	EPA 8140,8141A	Disulfoton	None	µg/L	DFG-WPCL	0.01	0.05	GC-FPD
samplewater	EPA 8140,8141A	Malathion	None	µg/L	DFG-WPCL	0.03	0.05	GC-FPD
samplewater	EPA 8140,8141A	Methamidophos	None	µg/L	DFG-WPCL	0.10	0.2	GC-FPD
samplewater	EPA 8140,8141A	Methidathion	None	µg/L	DFG-WPCL	0.03	0.05	GC-FPD
samplewater	EPA 8140,8141A	Methyl Parathion	None	µg/L	DFG-WPCL	0.01	0.05	GC-FPD
samplewater	EPA 8140,8141A	Parathion	None	µg/L	DFG-WPCL	0.01	0.02	GC-FPD
samplewater	EPA 8140,8141A	Phorate	None	µg/L	DFG-WPCL	0.05	0.2	GC-FPD
samplewater	EPA 8140,8141A	Phosmet	None	µg/L	DFG-WPCL	0.05	0.2	GC-FPD

## QUALITY ASSURANCE PROCEDURES

Quality assurance samples are collected and analyzed to guarantee that the data generated during the analytical phase of the project fulfill quality control specifications for precision, accuracy, representativeness, comparability and completeness (PARC). Three types of quality assurance samples were evaluated by UC Davis: field blanks, field duplicates and matrix spike samples. Field blanks were generated to demonstrate that neither the sampling procedures nor atmospheric exposure resulted in contaminated samples. Field blanks were collected at a rate of 5% of the total number of samples along with the associated environmental sample. Field blanks were assigned randomly to sampling sites and were distinguished from the environmental sample through a time offset of 1 minute. Water used for the blanks consisted of deionized water from the Institute of Ecology, UC Davis for all blanks except the blanks established for metals and water column toxicity. MilliQ water was used for the metal samples and tap water from the DFG ATL for the toxicity samples.

Field duplicate samples demonstrate the precision of the analytical process. Duplicates were collected in rapid succession and in an identical manner to the associated environmental sample. Duplicates were collected at a rate of 5% of the total samples and were assigned randomly to sample sites. Duplicates were distinguished from the environmental sample through a time offset of 3 minutes. For cases where contaminants were detected in both samples, the assessment of the difference in concentration between the environmental sample and the paired replicate was determined by calculating the relative percent difference between the two values, which is defined as:

$$RPD = (([C_{env} - C_{rep}] / ([C_{env} + C_{rep}] / 2)) * 100$$

RPD = the relative percent difference

$C_{env}$  = concentration of pesticide in environmental sample

$C_{rep}$  = concentration of pesticide in replicate sample.

If an RPD greater than 25% is confirmed by reanalysis, the environmental results were qualified as estimated.

The purpose of analyzing matrix spikes and matrix spike duplicates was to demonstrate the performance of the analytical method in a particular sample matrix. Matrix spike and matrix spike duplicate samples were collected at a rate of 5%, assigned randomly to sites and labeled with a time offset of 9 minutes. Recovery is the accuracy of an analytical test measured against a known analyte addition to a sample.

Recovery is calculated as follows:

$$\text{Recovery} = ((\text{Matrix plus spike result} - \text{Matrix result}) * 100) / \text{expected Matrix plus spike result}$$

If matrix spike recovery of any analyte was outside of the acceptable range, the result was determined to have failed the acceptance criteria (80-120%).

## RESULTS

### PESTICIDES

During the 2005 dormant season, 157 water samples each were collected from 15 sites for analyses of organochlorine (OCH), organophosphate (OP), and pyrethroid pesticides. Forty-seven water samples were collected for herbicide analyses from five selected sites: NSJ28, NSJ32, SSJ03, FT14 and FT16 (Table 13). The DFG pesticide laboratory conducted 28 additional herbicide analyses on surplus water (excess from the other pesticide analyses). Of the four pesticide classes, organophosphate pesticides and herbicides were detected with the highest frequencies (78% and 69%, respectively).

Diazinon (71%) and simazine (67%) had the highest detection frequencies, followed by chlorpyrifos (41%), atrazine (38%), methidathion (19%) and disulfoton (15%). All other pesticides were identified at frequencies ranging from zero to seven percent (Figure 9). The highest individual pesticide concentration found during this sampling period was 5.40µg/L of simazine at NSJ28.

Organochlorine pesticides were detected infrequently (4%), with DDE (p, p') being found in 6 out of 157 samples. Organochlorine pesticides were only detected on sites in the Delta region, D01 and D02. The highest DDE (p,p') concentration found was 0.007µg/L at D02. Six of seven samples containing organochloride pesticides were collected from D02.

Seventy-eight percent of the water samples contained organophosphates. Diazinon and chlorpyrifos were identified at high rates (71% and 41%, respectively). CS15 showed the highest diazinon concentration with 1.610µg/L during the second storm. Organophosphate pesticides were never detected CS07, whereas the remaining sites revealed multiple detections during the season.

Pyrethroid pesticides were identified in four percent of the samples. Permethrin-1 and permethrin-2 were the only pyrethroids detected (4% each). Although the pyrethroid detection sites were spread throughout the Central Valley (CS07, D01, D02, D03, FT03, and FT16), all detections for this season occurred on January 28 and 29. The highest detections for the two pyrethroid pesticides were both found at D03 with 0.216µg/L for permethrin-1 and 0.390 µg/L for permethrin-2.

Herbicides were found in 52 of 75 samples. Simazine was the most common herbicide detected (67%) with the maximum concentration of 5.40 µg/L at NSJ28 followed by atrazine with a frequency of 36%. No herbicides were found at one designated sampling site FT14.

## PESTICIDE LOADS

Loads were calculated for the sampling events discharge was measured and pesticides were detected (Table 14). In those cases the load (kg/day) was calculated by multiplying the discharge with the concentration including the corresponding conversions.

## PHYSICAL PARAMETERS, NUTRIENTS AND HARDNESS

UC Davis collected 148 water samples each for physical parameters, nutrients and hardness (Table 15). Ammonia was detected with a frequency of 37%. The highest concentration with 12.7 mg/L was found at NSJ32. Nitrate and nitrite were found in 135 samples with the maximum concentration of 6.2 mg/L at D02. D03 had the highest nitrite concentration of 0.173 mg/L and also the highest result for hardness with 1250 mg/L.

Water color was detected with a frequency of 91% and SSJ03 presented the highest value with 200 color units. D02 appeared to have the highest amount of Total Dissolved Solids (TDS) with 1540mg/L out of 148 samples. TOC, Turbidity and Hardness were found in 100% the collected samples. Most turbid was CS15 with a value of 250 NTU's.

## WATER COLUMN TOXICITY

Thirty-one water column samples were collected and tested for toxicity (Table 16). 40% of the 96-hr tests with the algae resulted in significantly different growth of the sample compared to the control group. Acute tests run with *Ceriodaphnia dubia* resulted in significant mortality in 6 out 31 water samples (19%). 100% mortality was found at CS15 on day one of storm event #1, day one and three of storm event #2, and at SSJ03 on day one of storm event #1. Significantly different survival (40%) was found at D02 on day one of storm event #1 and at CS07 (45%) on day two of storm event #1. No statistically significant differences between control and treatment survival were seen in the 96-hr toxicity tests with the fathead minnows.

During the first storm event, two TIEs were performed on samples from SSJ03 and CS15 to determine the cause of toxicity to *Ceriodaphnia*. The dilution series test on the sample from SSJ03 collected on January 27 indicated that 2.7 Acute Toxic Units ( $= 100/IC_{50}$ ) were present in the sample. Cationic metals were eliminated as the potential cause. Aeration removed some of the toxicity suggesting that volatile organic compounds could be a factor in the toxicity. The toxicity was removed by running the sample through a C-8 SPE column suggesting a non-polar organic compound was involved. Piperonyl butoxide (PBO) removed all of the toxicity indicating a metabolically activated pesticide(s) was responsible for the toxicity. The metabolically activated pesticides present in the sample were diazinon and chlorpyrifos.

The dilution series test performed on the sample from CS15 from January 26 found 1.3 TUs present in the sample. TIE testing indicated that metabolically activated pesticides were also responsible for the observed toxicity. Both diazinon and methidathion were present in the sample and could account for the toxic units observed.

Three Toxicity Identification Evaluations (TIEs) were performed on samples from 2 sites from the first storm event and two TIEs were performed on samples from 2 sites from the second storm event. The sample from CS15 collected on February 16 exhibited significant toxicity to *Ceriodaphnia*. The dilution series test indicated that 10.7 TUs were present in the sample. Cationic metals and volatile organic compounds were eliminated as potential causes. The toxicity was removed by running the sample through a C-8 Solid Phase Extraction (C-8 SPE) column suggesting a non-polar organic compound was involved. PBO prevented most of the toxicity suggesting a metabolically activated pesticide(s) was responsible for the toxicity. The metabolically activated pesticide present in samples collected on that day from that site is diazinon (see Table 13). Diazinon was present at 1.5 µg/L, a sufficient concentration to account for the toxicity.

The sample at CS15 from February 16 was also toxic to algae. The initial dilution series test indicated 3.8 TUs were present in the sample. Cationic metals were eliminated as a potential source, and the toxicity was removed by the C-8 SPE column, indicating that a non-polar organic compound was responsible for the toxicity. These results implicate herbicides as the cause of the toxicity.

The sample at SS06 from February 16 was also toxic to algae. The dilution series test indicated that 5.4 TUs were present in the sample. As with the sample from CS15, further testing indicated that a non-polar organic compound was responsible for the toxicity. As with the sample from CS15, herbicides are implicated as the cause.

#### TOTAL ORGANIC CARBON, TEMPERATURE, pH, DO AND EC

One hundred forty-seven water samples from 14 sites (not SS06) were analyzed for Total Organic Carbon during the sampling period (Table 17). The concentration varied between 0.603 and 19.728 mg/L. The highest concentration with 19.728 mg/L was found at D03.

Water quality parameters were recorded for the 157 sampling events during the Dormant Season 2004 /2005. The water temperature varied between 6.6°C (CS15) and 15.2°C (FT03). Dissolved oxygen values ranged from 1.2 mg/L at D03 to 23.1 mg/L at CS07. The highest value for EC was found at D02 with 2680 µS. The lowest level found was 64 µS at NSJ28. Values for pH varied between 6.56 (NSJ31) and 11.4 (SSJ03) (Table 19).

#### TRACE METALS (IRRIGATION SEASON 2004)

During the 2004 irrigation season, 123 samples were collected and analyzed for arsenic, boron, cadmium, copper, nickel, phosphorus, lead, zinc and selenium, and 11 samples for cobalt (Table 18). Arsenic was found with a frequency of 99% and the highest concentration was 23.8 µg/L at D03. Boron was found in 98% of the samples with a maximum value of 1690 µg/L at SS03 (Willow Slough at Rd. 99). Cadmium was only seen in 44% of the samples with a maximum value of 0.16 µg/L at D03. All samples analyzed for cobalt showed detections. The highest detected value was 3.17 µg/L at SS03. Copper, nickel, lead and zinc were all detected with a frequency of 100%. The maximum concentration of copper was 17.9 µg/L (D03), nickel was 22.8 µg/L (NSJ18,

Orestimba Creek at Kilburn Rd.), lead was 4.3 µg/L (NSJ18) and zinc was 25.8 µg/L (SSJ08, Poso Drain at Intersection of Turner Island Rd and Palazzo Rd.). Phosphorus was detected in 98% of the samples and its highest concentration was 1902 µg/L (D03). Selenium was only detected in 45% of the samples with a maximum concentration of 3.48 µg/L (D02).

#### TRACE METALS (DORMANT SEASON 2004 / 2005)

CS15, D01, D02, D03, NSJ28 and SSJ12 were monitored for arsenic, boron, cadmium, copper, lead, nickel, phosphorus, selenium and zinc (Table 18a). All metals except cadmium and selenium (both 78%) were found with a frequency of 100%. The highest concentrations of those nine metals were found at four of the 15 sites. CS15 had the highest copper (24.9 µg/L) and nickel (51.5 µg/L) concentrations. D02 had the highest selenium concentration (6.88 µg/L). D03 had the highest arsenic (11.2 µg/L), boron (1580 µg/L), cadmium (0.14 µg/L) and phosphorus (1417 µg/L) concentrations. Three of those four detections at D03 appeared on day two of the first storm event. NSJ28 had the highest concentrations of lead (4.85 µg/L) and zinc (59.6 µg/L).

Table 13. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Table 10. Summary of pesticides detected during the Dormant Season 2004-2005 (pg 12). No values indicate results below the RL and MRL.																								
Site ID	Date	Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Methyl	Phorate	Phosmet	Parathion, Ethyl	
			Organochlorine Pesticides											Organophosphate Pesticides										
CS07	01/26/2005	9:20																						
CS07	01/26/2005	16:40																						
CS07	01/27/2005	8:50																						
CS07	01/27/2005	12:20																						
CS07	01/27/2005	16:20																						
CS07	01/28/2005	8:20																						
CS07	01/28/2005	12:20																						
CS07	01/28/2005	18:20																						
CS07	01/29/2005	8:40																						
CS07	01/29/2005	12:40																						
CS07	01/29/2005	16:30																						
CS07	01/31/2005	11:50																						
CS07	02/03/2005	12:50																						
CS07	02/16/2005	15:50																						
CS07	02/20/2005	11:00																						
CS15	01/26/2005	7:30													0.592				0.043					
CS15	01/26/2005	13:00													0.418				0.045					
CS15	01/26/2005	17:50													0.017				0.040					
CS15	01/27/2005	7:20													0.088				0.039					
CS15	01/27/2005	13:00													0.084				0.037					
CS15	01/27/2005	17:20													0.082				0.040					
CS15	01/28/2005	7:20													0.056				0.038					
CS15	01/28/2005	14:20													0.070									
CS15	01/28/2005	18:20													0.067									
CS15	01/29/2005	7:20																						
CS15	01/29/2005	13:10													0.063									
CS15	01/29/2005	17:50													0.068									
CS15	01/31/2005	8:40													0.084									
CS15	02/03/2005	9:50												0.090	0.026									
CS15	02/16/2005	7:50													0.308				0.200					
CS15	02/16/2005	15:00													1.500									
CS15	02/17/2005	7:50													0.171									
CS15	02/17/2005	14:10													0.153									
CS15	02/18/2005	13:30													1.610									
CS15	02/19/2005	8:50													0.140									
CS15	02/23/2005	9:30																						
D01	01/26/2005	17:50				0.002								0.050	0.398				0.044					
D01	01/27/2005	10:30												0.032	0.410				0.022					
D01	01/28/2005	10:40												0.061	0.590				0.043					
D01	01/29/2005	11:00												0.072	0.728				0.044					
D01	01/31/2005	10:10													0.430									
D01	02/03/2005	11:00												0.030	0.312									
D01	02/15/2005	10:10												0.018	0.226									
D01	02/16/2005	10:00												0.042	0.258									

Table 13 continued. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Site ID	Date	Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Methyl	Phorate	Phosmet	Parathion, Ethyl
			Organochlorine Pesticides										Organophosphate Pesticides										
D02	01/26/2005	12:20				0.004		0.005						0.012	0.072		0.362						
D02	01/27/2005	12:50				0.003								0.006	0.041		0.418						
D02	01/28/2005	14:00												0.010	0.053		0.286						
D02	01/29/2005	12:30				0.006									0.043		0.214						
D02	01/31/2005	12:00													0.169		0.140						
D02	02/03/2005	11:30			0.002										0.079		0.062						
D02	02/15/2005	12:00				0.007									0.023		0.158						
D02	02/16/2005	11:30				0.004								0.036	0.117		0.118						
D03	01/26/2005	16:20																					
D03	01/27/2005	14:20													0.022								
D03	01/28/2005	16:50													0.025								
D03	01/29/2005	14:30													0.024								
D03	01/31/2005	13:20																					
D03	02/03/2005	12:30													0.073								
D03	02/15/2005	13:20																					
D03	02/16/2005	12:50													0.129								
FT03	01/27/2005	11:20												0.024	0.015								
FT03	01/27/2005	15:20												0.024	0.012				0.060				
FT03	01/28/2005	7:30												0.027					0.170				
FT03	01/28/2005	11:50												0.028					0.077				
FT03	01/28/2005	16:00												0.024					0.045				
FT03	01/29/2005	7:30												0.026					0.090				
FT03	01/29/2005	11:40												0.029	0.017				0.128				
FT03	01/29/2005	15:50												0.037					0.272				
FT03	01/30/2005	7:30												0.021									
FT03	01/30/2005	12:00												0.019									
FT03	01/30/2005	16:00												0.028									
FT03	02/01/2005	12:40												0.020									
FT03	02/04/2005	12:40													0.075								
FT14	01/29/2005	14:20												0.011	0.020								
FT14	01/30/2005	13:00												0.024	0.086								
FT14	02/01/2005	14:00																					
FT14	02/04/2005	15:20																					
FT16	01/27/2005	17:10												0.033	0.013								
FT16	01/28/2005	8:50												0.030	0.014								
FT16	01/29/2005	8:40												0.028	0.026								
FT16	01/30/2005	8:40												0.021									
FT16	02/01/2005	11:20												0.024									
FT16	02/04/2005	11:10												0.026									
NS04	01/26/2005	13:00													0.017								
NS04	01/27/2005	10:40													0.015								
NS04	01/28/2005	10:00																					
NS04	01/29/2005	10:20													0.017								
NS04	01/31/2005	9:50																					
NS04	02/03/2005	11:10													0.064								
NS04	02/16/2005	12:10																					

Table 13 continued. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Site ID	Date	Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Methyl	Phorate	Phosmet	Parathion, Ethyl
Organochlorine Pesticides												Organophosphate Pesticides											
NSJ28	01/27/2005	13:00											0.029	0.738	0.087			0.083	0.064				
NSJ28	01/27/2005	19:10											0.025	0.770				0.101	0.048				
NSJ28	01/28/2005	10:00											0.026	0.622			0.033	0.050	0.046				
NSJ28	01/28/2005	15:00											0.032	0.486			0.022	0.040	0.032				
NSJ28	01/29/2005	11:00											0.023	0.502			0.029	0.034	0.035				
NSJ28	01/29/2005	17:00											0.025	0.412			0.028	0.033	0.029				
NSJ28	01/30/2005	10:00											0.016	0.248			0.013						
NSJ28	01/30/2005	16:00											0.014	0.224			0.020						
NSJ28	02/01/2005	13:00												0.148									
NSJ28	02/04/2005	9:50												0.230			0.130						
NSJ28	02/15/2005	11:00												0.166			0.073		0.058				
NSJ28	02/15/2005	17:00											0.036	0.204	0.053		0.125	0.090	0.151				
NSJ28	02/16/2005	10:50											0.040	0.210				0.048	0.078				
NSJ28	02/16/2005	16:50											0.040	0.198			0.051	0.056	0.083				
NSJ31	01/27/2005	11:00											0.010	0.028			0.011						
NSJ31	01/27/2005	17:20												0.022			0.016						
NSJ31	01/28/2005	9:00											0.012	0.039									
NSJ31	01/28/2005	14:00												0.030									
NSJ31	01/29/2005	9:00											0.013	0.028									
NSJ31	01/29/2005	15:00											0.011	0.033									
NSJ31	01/30/2005	8:30												0.024									
NSJ31	01/30/2005	14:30												0.020									
NSJ31	02/01/2005	9:40												0.073									
NSJ31	02/15/2005	9:40																					
NSJ31	02/15/2005	15:40																					
NSJ31	02/16/2005	9:50																					
NSJ31	02/16/2005	15:50																					
NSJ31	02/17/2005	10:20												0.118									
NSJ31	02/17/2005	16:20												0.128									
NSJ32	01/27/2005	16:20												0.208				0.018					
NSJ32	01/28/2005	12:30											0.014	1.102				0.085					
NSJ32	01/29/2005	12:10											0.011	0.033									
NSJ32	01/30/2005	12:00												0.040									
NSJ32	02/01/2005	11:00												0.073									
NSJ32	02/04/2005	9:00												0.090									
NSJ32	02/15/2005	12:00												0.129									
NSJ32	02/16/2005	12:00												0.148									
NSJ32	02/17/2005	11:30												0.140					0.090				
SS06	01/26/2005	14:50												0.145									
SS06	01/27/2005	10:20												0.160									
SS06	01/28/2005	10:50											0.011	0.137									
SS06	01/29/2005	10:00											0.012	0.118									
SS06	01/31/2005	12:20												0.142									
SS06	02/03/2005	11:40												0.146									
SS06	02/16/2005	10:40												0.120									
SS06	02/17/2005	10:30												0.115									
SS06	02/18/2005	10:00												0.118									

Table 13 continued. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Site ID	Date	Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Methyl	Phorate	Phosmet	Parathion, Ethyl
			Organochlorine Pesticides										Organophosphate Pesticides										
SSJ03	01/27/2005	9:50												0.035	0.562		0.023						
SSJ03	01/27/2005	14:00												0.031	0.392		0.015						
SSJ03	01/27/2005	18:00												0.029	0.274		0.014						
SSJ03	01/28/2005	8:40												0.015	0.037								
SSJ03	01/28/2005	12:40												0.016	0.036								
SSJ03	01/28/2005	16:40												0.015	0.033								
SSJ03	01/29/2005	8:30												0.019	0.037								
SSJ03	01/29/2005	12:30												0.021	0.032								
SSJ03	01/29/2005	16:30												0.021	0.029								
SSJ03	01/30/2005	8:30												0.021	0.021								
SSJ03	01/30/2005	12:30												0.025	0.020								
SSJ03	01/30/2005	16:30												0.015	0.019								
SSJ03	02/01/2005	10:30																					
SSJ03	02/04/2005	10:40												0.025	0.068								
SSJ12	01/27/2005	12:00													0.015								
SSJ12	01/28/2005	10:40													0.033								
SSJ12	01/29/2005	10:30																					
SSJ12	01/30/2005	9:30																					
SSJ12	02/01/2005	12:00																					
SSJ12	02/04/2005	11:50																					
Maximum value			0	0	0.002	0.007	0	0.005	0	0	0	0	0	0.090	1.610	0.087	0.418	0.101	0.272	0	0	0	0
Median			na	na	0.002	0.004	na	0.005	na	na	na	na	na	0.024	0.084	0.070	0.051	0.050	0.046	na	na	na	na
90th percentile			na	na	0.002	0.007	na	0.005	na	na	na	na	na	0.039	0.486	0.083	0.272	0.090	0.153	na	na	na	na
Total amount of samples			157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
Frequency %			0%	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	41%	71%	1%	15%	7%	19%	0%	0%	0%	0%

*Italic* values shown under Herbicides were additional samples analysed by DF&G and therefore were not incorporated into the QC / QA calculations  
na = not applicable

Table 13 continued. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Site ID	Date	Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	Deltamethrin	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2	Lambda cyhalothrin-1	Lambda cyhalothrin-2	Atrazine	Cyanazine	Molinate	Simazine	Thiobencarb
			Pyrethroid Pesticides																Herbicides				
CS07	01/26/2005	9:20																					
CS07	01/26/2005	16:40																					
CS07	01/27/2005	8:50																					
CS07	01/27/2005	12:20																					
CS07	01/27/2005	16:20																					
CS07	01/28/2005	8:20																					
CS07	01/28/2005	12:20																					
CS07	01/28/2005	18:20													0.009	0.016							
CS07	01/29/2005	8:40																					
CS07	01/29/2005	12:40																					
CS07	01/29/2005	16:30																					
CS07	01/31/2005	11:50																					
CS07	02/03/2005	12:50																					
CS07	02/16/2005	15:50																					
CS07	02/20/2005	11:00																					
CS15	01/26/2005	7:30																					
CS15	01/26/2005	13:00																					
CS15	01/26/2005	17:50																					
CS15	01/27/2005	7:20																					
CS15	01/27/2005	13:00																					
CS15	01/27/2005	17:20																	0.024				
CS15	01/28/2005	7:20																					
CS15	01/28/2005	14:20																					
CS15	01/28/2005	18:20																					
CS15	01/29/2005	7:20																					
CS15	01/29/2005	13:10																					
CS15	01/29/2005	17:50																					
CS15	01/31/2005	8:40																					
CS15	02/03/2005	9:50																					
CS15	02/16/2005	7:50																					
CS15	02/16/2005	15:00																					
CS15	02/17/2005	7:50																					
CS15	02/17/2005	14:10																					
CS15	02/18/2005	13:30																					
CS15	02/19/2005	8:50																					
CS15	02/23/2005	9:30																					
D01	01/26/2005	17:50																					
D01	01/27/2005	10:30																					
D01	01/28/2005	10:40																					
D01	01/29/2005	11:00													0.072	0.104							
D01	01/31/2005	10:10																					
D01	02/03/2005	11:00																					
D01	02/15/2005	10:10																					
D01	02/16/2005	10:00																					

Table 13 continued. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Site ID	Date	Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	Deltamethrin	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2	Lambda cyhalothrin-1	Lambda cyhalothrin-2	Atrazine	Cyanazine	Molinate	Simazine	Thiobencarb
			Pyrethroid Pesticides																Herbicides				
D02	01/26/2005	12:20																	0.041			0.586	
D02	01/27/2005	12:50																	0.040			0.590	
D02	01/28/2005	14:00													0.007	0.021							
D02	01/29/2005	12:30																					
D02	01/31/2005	12:00																					
D02	02/03/2005	11:30																					
D02	02/15/2005	12:00																					
D02	02/16/2005	11:30																					
D03	01/26/2005	16:20																					
D03	01/27/2005	14:20																					
D03	01/28/2005	16:50													0.216	0.390							
D03	01/29/2005	14:30																					
D03	01/31/2005	13:20																					
D03	02/03/2005	12:30																					
D03	02/15/2005	13:20																					
D03	02/16/2005	12:50																					
FT03	01/27/2005	11:20																				0.178	
FT03	01/27/2005	15:20																				0.426	
FT03	01/28/2005	7:30																					
FT03	01/28/2005	11:50													0.012	0.026							
FT03	01/28/2005	16:00																					
FT03	01/29/2005	7:30																					
FT03	01/29/2005	11:40																					
FT03	01/29/2005	15:50																					
FT03	01/30/2005	7:30																					
FT03	01/30/2005	12:00																					
FT03	01/30/2005	16:00																					
FT03	02/01/2005	12:40																					
FT03	02/04/2005	12:40																					
FT14	01/29/2005	14:20																					
FT14	01/30/2005	13:00																					
FT14	02/01/2005	14:00																					
FT14	02/04/2005	15:20																					
FT16	01/27/2005	17:10																				0.062	
FT16	01/28/2005	8:50													0.008	0.017						0.034	
FT16	01/29/2005	8:40																				0.030	
FT16	01/30/2005	8:40																				0.111	
FT16	02/01/2005	11:20																					
FT16	02/04/2005	11:10																					
NS04	01/26/2005	13:00																					
NS04	01/27/2005	10:40																					
NS04	01/28/2005	10:00																					
NS04	01/29/2005	10:20																					
NS04	01/31/2005	9:50																					
NS04	02/03/2005	11:10																					
NS04	02/16/2005	12:10																					

Table 13 continued. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Site ID	Date	Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	Deltamethrin	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2	Lambda cyhalothrin-1	Lambda cyhalothrin-2	Atrazine	Cyanazine	Molinate	Simazine	Thiobencarb
			Pyrethroid Pesticides																Herbicides				
NSJ28	01/27/2005	13:00																	0.286			0.278	
NSJ28	01/27/2005	19:10																	0.294			0.314	
NSJ28	01/28/2005	10:00																		0.264			
NSJ28	01/28/2005	15:00																	0.168			0.172	
NSJ28	01/29/2005	11:00																				0.061	
NSJ28	01/29/2005	17:00																				0.822	
NSJ28	01/30/2005	10:00																	0.100			0.704	
NSJ28	01/30/2005	16:00																	0.061			1.40	
NSJ28	02/01/2005	13:00																				1.92	
NSJ28	02/04/2005	9:50																	0.038			0.950	
NSJ28	02/15/2005	11:00																	0.440			4.16	
NSJ28	02/15/2005	17:00																	0.740			5.40	
NSJ28	02/16/2005	10:50																	0.091			2.90	
NSJ28	02/16/2005	16:50																	0.200			2.60	
NSJ31	01/27/2005	11:00																	0.042			1.09	
NSJ31	01/27/2005	17:20																	0.060			1.04	
NSJ31	01/28/2005	9:00																				0.954	
NSJ31	01/28/2005	14:00																	0.037			1.14	
NSJ31	01/29/2005	9:00																					
NSJ31	01/29/2005	15:00																					
NSJ31	01/30/2005	8:30																					
NSJ31	01/30/2005	14:30																					
NSJ31	02/01/2005	9:40																					
NSJ31	02/15/2005	9:40																					
NSJ31	02/15/2005	15:40																					
NSJ31	02/16/2005	9:50																					
NSJ31	02/16/2005	15:50																					
NSJ31	02/17/2005	10:20																					
NSJ31	02/17/2005	16:20																					
NSJ32	01/27/2005	16:20																				1.67	
NSJ32	01/28/2005	12:30																				2.82	0.498
NSJ32	01/29/2005	12:10																				1.800	
NSJ32	01/30/2005	12:00																	0.019			2.20	
NSJ32	02/01/2005	11:00																				3.00	
NSJ32	02/04/2005	9:00																	0.019			2.03	
NSJ32	02/15/2005	12:00																	0.020			1.60	
NSJ32	02/16/2005	12:00																	0.100			4.00	
NSJ32	02/17/2005	11:30																	0.021			4.00	
SS06	01/26/2005	14:50																					
SS06	01/27/2005	10:20																				4.88	
SS06	01/28/2005	10:50																					
SS06	01/29/2005	10:00																					
SS06	01/31/2005	12:20																					
SS06	02/03/2005	11:40																					
SS06	02/16/2005	10:40																0.061					
SS06	02/17/2005	10:30																					
SS06	02/18/2005	10:00																					

Table 13 continued. Summary of Pesticides detected during the Dormant Season 2004 / 2005 (µg/L). No values indicate results below the RL and MDL.

Site ID	Date	Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	Deltamethrin	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2	Lambda cyhalothrin-1	Lambda cyhalothrin-2	Atrazine	Cyanazine	Molinate	Simazine	Thiobencarb
Pyrethroid Pesticides																			Herbicides				
SSJ03	01/27/2005	9:50																	0.090	0.064		0.572	
SSJ03	01/27/2005	14:00																	0.134	0.094		0.790	
SSJ03	01/27/2005	18:00																	0.084	0.028		0.452	
SSJ03	01/28/2005	8:40																				0.318	
SSJ03	01/28/2005	12:40																				0.384	
SSJ03	01/28/2005	16:40																				0.335	
SSJ03	01/29/2005	8:30																				0.360	
SSJ03	01/29/2005	12:30																				0.492	
SSJ03	01/29/2005	16:30																				0.450	
SSJ03	01/30/2005	8:30																	0.016			0.682	
SSJ03	01/30/2005	12:30																				0.484	
SSJ03	01/30/2005	16:30																	0.016			0.696	
SSJ03	02/01/2005	10:30																				1.14	
SSJ03	02/04/2005	10:40																	0.019			0.606	
SSJ12	01/27/2005	12:00																				0.064	
SSJ12	01/28/2005	10:40																					
SSJ12	01/29/2005	10:30																					
SSJ12	01/30/2005	9:30																					
SSJ12	02/01/2005	12:00																					
SSJ12	02/04/2005	11:50																					
Maximum value			0	0	0	0	0	0	0	0	0	0	0	0	0.216	0.390	0	0.061	0.740	0.264	0	5.40	0.498
Median			na	na	na	na	na	na	na	na	na	na	na	na	0.010	0.023	na	0.061	0.060	0.079	na	0.70	0.389
90th percentile			na	na	na	na	na	na	na	na	na	na	na	na	0.144	0.247	na	0.061	0.289	0.213	na	3.10	0.476
Total amount of samples			157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	75	75	75	75	75
Frequency %			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	0%	1%	36%	5%	0%	67%	3%

*Italic* values shown under Herbicides were additional samples analysed by DF&G and therefore were not incorporated into the QC / QA calculations  
na = not applicable

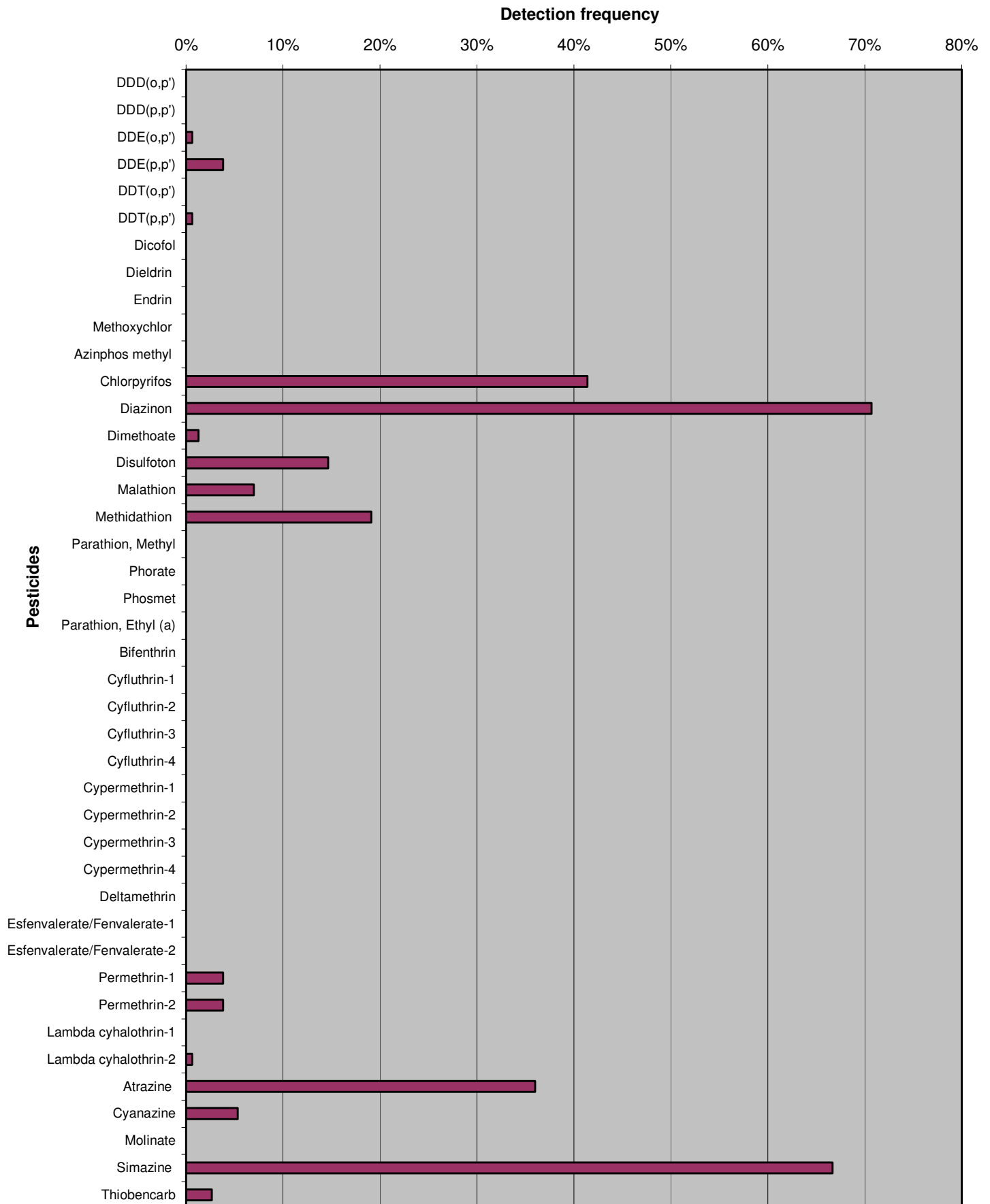
**Table 14. Summary of pesticide loads calculated for the Dormant Season 2004 / 2005 (in kg / day)**

Site ID	Date	Time	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Permethrin-1	Permethrin-2	Warrior-2	Atrazine	Simazine
			Organophosphate Pesticides						Pyrethroid Pesticides			Herbicides	
<b>CS07*</b>	01/28/2005	18:20							0.02827	0.05026			
<b>CS15</b>	01/26/2005	7:30		0.00323				0.00023					
CS15	01/26/2005	13:00		0.00254				0.00027					
CS15	01/26/2005	17:50		0.00006				0.00015					
CS15	01/29/2005	13:10		0.00051									
CS15	01/29/2005	17:50		0.00046									
CS15	01/31/2005	8:40		0.00007									
CS15	02/16/2005	7:50		0.00055				0.00036					
CS16	02/16/2005	15:00		0.02422									
CS15	02/17/2005	7:50		0.00171									
CS15	02/17/2005	14:10		0.00102									
CS15	02/18/2005	13:30		0.05652									
<b>FT16**</b>	01/27/2005	17:10	0.00977	0.00385									0.01835
FT16	01/28/2005	8:50	0.00719	0.00336					0.00192	0.00408			0.00815
FT16	01/29/2005	8:40	0.00754	0.00700									0.00807
FT16	01/30/2005	8:40	0.00421										0.02227
FT16	02/01/2005	11:20	0.00481										
FT16	02/04/2005	11:10	0.00515										
<b>NS04</b>	01/26/2005	13:00		0.00089									
NSJ28	01/29/2005	17:00	0.00039	0.00649		0.00044	0.00052	0.00046					0.01295
NSJ28	01/30/2005	10:00	0.00013	0.00200		0.00010						0.00080	0.00567
NSJ28	01/30/2005	16:00	0.00009	0.00140		0.00012						0.00038	0.00873
NSJ28	02/01/2005	13:00		0.00080									0.01038
NSJ28	02/04/2005	9:50		0.00015		0.00009						0.00003	0.00063
NSJ28	02/15/2005	11:00		0.00096		0.00042		0.00033				0.00254	0.02402
NSJ28	02/15/2005	17:00	0.00156	0.00884	0.00230	0.00542	0.00390	0.00655				0.03208	0.23411
NSJ28	02/16/2005	10:50	0.00292	0.01533			0.00350	0.00569				0.00664	0.21165
NSJ28	02/16/2005	16:50	0.00273	0.01352		0.00348	0.00382	0.00567				0.01365	0.17748
<b>NSJ31</b>	01/30/2005	8:30		0.00140									
NSJ31	01/30/2005	14:30		0.00088									
NSJ31	02/01/2005	9:40		0.00048									
NSJ31	02/17/2005	10:20		0.00493									
NSJ31	02/17/2005	16:20		0.00479									
<b>NSJ32</b>	02/15/2005	12:00		0.00191								0.00030	0.02364
NSJ32	02/16/2005	12:00		0.02741								0.01852	0.74083
NSJ32	02/17/2005	11:30		0.03240				0.02083				0.00486	0.92579
<b>SS06</b>	01/26/2005	14:50		0.00050									
SS06	01/28/2005	10:50	0.00010	0.00120									
SS06	01/29/2005	10:00	0.00003	0.00025									
SS06	02/16/2005	10:40		0.00301							0.00153		
SS06	02/18/2005	10:00		0.00492									

CS07 \* = Discharge was obtained from CDEC gage BCD

FT16 \*\* = Discharge was obtained from the Kings River Water Association, values reflect mean daily flows, the gage is located approx. 16 miles upstream the sampling location

**Figure 9. Frequency of pesticide detections during the 2004 / 2005 dormant season sampling**



**Table 15. Summary of Inorganic Constituents detected during the Dormant Season 2004 / 2005. No values indicate no detections or values below the quantification limit.**

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
CS07	01/26/05	9:20		0.0348				67	1.00	39.6
CS07	01/26/05	16:40		0.0559		0.0106	6	66	3.1	37.6
CS07	01/27/05	8:50		0.0516		0.0113	10	59	6.6	34.6
CS07	01/27/05	12:20		0.0405		0.0112	11	61	4.3	31.7
CS07	01/27/05	16:20		0.0343		0.0111	10	59	3.5	31.7
CS07	01/28/05	8:20		0.0560		0.0110	7	61	3.2	38.4
CS07	01/28/05	12:20		0.0373		0.0112	9	60	4.9	36.4
CS07	01/28/05	18:20		0.0331		0.0112		60	4.7	37.4
CS07	01/29/05	8:40		0.0394		0.0189		63	2.4	40.6
CS07	01/29/05	12:40		0.0315		0.0187		63	1.9	41.6
CS07	01/29/05	16:30		0.0288		0.0202	7	65	1.7	41.6
CS07	01/31/05	11:50		0.0371		0.0195		66	1.2	45.9
CS07	02/03/05	12:50		0.0338		0.0146		79	0.80	76.5
CS07	02/16/05	15:50				0.0218		69	1.4	39.0
CS07	02/20/05	11:00		0.0312		0.0158		72	4.2	41.5
CS15	01/26/05	7:30	0.151	0.728	0.0127	0.153	44	354	250	49.5
CS15	01/26/05	13:00		0.430	0.0102	0.141	69	356	120	170
CS15	01/26/05	17:50		0.206		0.116	47	512	70	212
CS15	01/27/05	7:20				0.0990	70	624	29	297
CS15	01/27/05	13:00				0.0964	29	590	23	297
CS15	01/27/05	17:20				0.0942	20	648	18	277
CS15	01/28/05	7:20	0.105	0.0412		0.128	38	616	180	303
CS15	01/28/05	14:20		0.0366		0.218	85	398	190	152
CS15	01/28/05	18:20		0.0263		0.222	90	359	170	141
CS15	01/29/05	7:20	0.127	0.0267		0.205	75	362	130	187
CS15	01/29/05	13:10		0.0250		0.198	70	349	110	156
CS15	01/29/05	17:50		0.0219		0.191	70	355	110	187
CS15	01/31/05	8:40				0.146	70	384	65	199
CS15	02/03/05	9:50	0.213	0.0414		0.103	55	438	38	214
CS15	02/16/05	7:50	0.104	0.470	0.0110	0.0551		195	40	83.6
CS15	02/16/05	15:00	0.139	0.666	0.0189	0.329	46	522	110	226
CS15	02/17/05	7:50				0.108	46	615	45	286
CS15	02/17/05	14:10				0.110	65	533	50	244
CS15	02/18/05	13:30	0.155	0.644	0.0173	0.242	75	310	140	110
CS15	02/19/05	8:50		0.0588		0.222	110	356	130	126
CS15	02/23/05	9:30		0.0272		0.118	44	360	50	182
D01	01/26/05	17:50	0.385	1.30	0.0368	0.251	11	390	210	94.0
D01	01/28/05	10:40	0.319	1.83	0.0439	0.273	16	412	160	131
D01	02/03/05	11:00	0.644	0.585	0.0680	0.0316	19	491	14	235
D01	02/15/05	10:10	0.476	0.467	0.0243	0.0232	25	544	5.6	255
D01	02/16/05	10:00	0.173	0.890	0.0264	0.282	18	321	80	129
D01	01/27/05	10:30	0.130	0.642	0.0310	0.201	13	261	75	112
D01	01/29/05	11:00	0.226	0.449	0.0327	0.158	12	403	200	208
D01	01/31/05	10:10	0.447	0.630	0.0537	0.111	15	364	85	224

**Table 15 continued. Summary of Inorganic Constituents detected during the Dormant Season 2004 / 2005. No values indicate no detections or values below the quantification limit.**

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
D02	01/26/05	12:20	0.271	3.42	0.0283	0.108		1260	100	693
D02	01/28/05	14:00	0.347	5.60	0.0701	0.0912		1540	12	828
D02	02/03/05	11:30		0.656	0.0116	0.0927	22	1220	8.3	729
D02	02/15/05	12:00		0.946	0.0143	0.0740	11	777	38	607
D02	02/16/05	11:30	0.128	1.77	0.0277	0.115		668	26	576
D02	01/27/05	12:50	0.225	6.20	0.0566	0.106	6	1470	18	713
D02	01/29/05	12:30	0.205	3.86	0.0503	0.0993	5	1460	11	884
D02	01/31/05	12:00	0.169	2.34	0.0304	0.0823	5	1390	55	785
D03	01/26/05	16:20	2.70	0.750	0.0792	0.467	17	1280	65	594
D03	01/28/05	16:50	1.25	4.45	0.173	0.258	13	1190	80	586
D03	02/03/05	12:30	0.881	0.958	0.0542	0.220	16	1380	38	1250
D03	02/15/05	13:20	1.24	3.25	0.0538	0.302	18	1070	50	571
D03	02/16/05	12:50	0.931	3.84	0.103	0.120	31	1020	60	459
D03	01/27/05	14:20	1.21	1.05	0.0665	0.286	15	1260	29	693
D03	01/29/05	14:30	1.11	1.87	0.0927	0.161	16	1280	40	936
D03	01/31/05	13:20	1.02	1.28	0.0655	0.182	13	1280	45	1020
FT03	01/27/05	11:20		0.127		0.0186	25	69	4.9	36.7
FT03	01/27/05	15:20		0.493		0.0286	11	69	5.7	38.9
FT03	01/28/05	7:30		0.141		0.0137	21	64	4.6	36.4
FT03	01/28/05	11:50		0.100		0.0140	23	65	3.7	44.4
FT03	01/28/05	16:00		0.0883		0.0132	25	67	3.6	40.4
FT03	01/29/05	7:30		0.112		0.0237	29	68	4	35.4
FT03	01/29/05	11:40		0.0747		0.0198	22	68	2.9	39.5
FT03	01/29/05	15:50		0.0765		0.0194	26	69	2.8	39.5
FT03	02/01/05	12:40				0.0112	19	67	3	40.8
FT03	02/04/05	12:40					18	73	3.3	45.7
FT03	01/30/05	7:30		0.0838		0.0171	23	66	3.4	41.8
FT03	01/30/05	12:00		0.0441		0.018	24	66	3	40.8
FT03	01/30/05	16:00		0.0440		0.0178	24	67	3	40.8
FT14	01/29/05	14:20		0.298		0.0502	18	120	35	66.6
FT14	01/30/05	13:00		0.254		0.106	22	98	19	65.3
FT14	02/01/05	14:00		0.17		0.0639	16	88	5.6	47.6
FT14	02/04/05	15:20		0.0735		0.155	19	73	4.4	45.7
FT16	01/27/05	17:10		0.149		0.0166	23	104	1.7	69.1
FT16	01/28/05	8:50		0.489		0.0257	18	90	2.6	64.6
FT16	01/29/05	8:40		0.482		0.0287	14	97	1.8	62.4
FT16	01/30/05	8:40		0.469		0.0292	22	103	2	73.4
FT16	02/01/05	11:20		0.420		0.0218	14	172	1.3	74.8
FT16	02/04/05	11:10		0.307		0.0160	15	114	1.3	68.6
NS04	01/26/05	13:00		0.194		0.0194		119	1.6	69.3
NS04	01/27/05	10:40		0.0234		0.0171	32	75	6.3	39.6
NS04	01/28/05	10:00				0.0152	27	73	5.2	40.4
NS04	01/29/05	10:20		0.0404		0.0271	20	80	3.1	46.8
NS04	01/31/05	9:50		0.0988		0.0310	16	89	2.2	57.1
NS04	02/03/05	11:10		0.210		0.0245	15	118	1.6	85.0
NS04	02/16/05	12:10		0.178		0.0407	11	114	1.4	80.0

**Table 15 continued. Summary of Inorganic Constituents detected during the Dormant Season 2004 / 2005. No values indicate no detections or values below the quantification limit.**

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
NSJ28	01/27/05	13:00	0.497	0.528	0.0388	0.0720	15	55	15	27.7
NSJ28	01/27/05	19:10	0.491	0.538	0.0443	0.0732	26	53	14	23.8
NSJ28	01/28/05	10:00	0.523	0.668	0.0428	0.0931	35	99	30	43.2
NSJ28	01/28/05	15:00	0.397	0.350	0.0194	0.111	24	45	27	19.4
NSJ28	01/29/05	11:00	0.358	0.431	0.0310	0.0613	18	63	13	43.7
NSJ28	01/29/05	17:00	0.392	0.378	0.0246	0.0775	20	46	10	29.1
NSJ28	01/30/05	10:00	0.193	0.443	0.0223	0.0512	20	74	15	62.4
NSJ28	01/30/05	16:00	0.228	0.469	0.0249	0.0535	20	76	13	52
NSJ28	02/01/05	13:00					21	106	20	102
NSJ28	02/04/05	9:50	0.181	0.457	0.0129	0.0408	19	118	45**	78.4
NSJ28	02/15/05	11:00	0.241	0.296	0.0211	0.0420	25	110	9.8	71.4
NSJ28	02/15/05	17:00	0.760	0.910	0.0961	0.0963	41	117	22	61.2
NSJ28	02/16/05	10:50	0.519	0.496	0.0265	0.158	28	48	25	24.8
NSJ28	02/16/05	16:50	0.428	0.335	0.0273	0.129	27	48	18	22.0
NSJ31	01/27/05	11:00		0.906		0.0484	95	126	65	49.5
NSJ31	01/27/05	17:20		0.824		0.0373	95	125	40	41.4
NSJ31	01/28/05	09:00		0.862		0.121	95	147	70	75.6
NSJ31	01/28/05	14:00		0.856	0.0131	0.0841	140	148	50	108
NSJ31	01/29/05	9:00		0.820		0.0658	85	123	40	135
NSJ31	01/29/05	15:00		0.764	0.0103	0.0565	85	120	45	83.2
NSJ31	01/30/05	8:30		0.668		0.0441	80	116	36	93.6
NSJ31	01/30/05	14:30		0.634		0.0397	80	113	33	83.2
NSJ31	02/01/05	9:40		0.654		0.0237	80	118	29	54.4
NSJ31	02/15/05	9:40					17	164	2.1	102
NSJ31	02/15/05	15:40					17	118	2.4	93.8
NSJ31	02/16/05	9:50		0.0244		0.0277	38	146	6.2	93.0
NSJ31	02/16/05	15:50		0.0289		0.0184	26	136	5.6	94.0
NSJ31	02/17/05	10:20		0.403		0.0277	75	122	26	50.0
NSJ31	02/17/05	16:20		0.479		0.0281	75	121	29	38.0
NSJ32	01/27/05	16:20	0.400	0.956	0.0402	0.410	90	131	30	64.3
NSJ32	01/28/05	12:30	0.861	1.00	0.0363	0.774	110	178	160	140
NSJ32	01/29/05	12:10	0.646	0.816	0.0279	0.546	90	134	33	72.8
NSJ32	01/30/05	12:00	0.533	0.876	0.0282	0.576	90	144	24	83.2
NSJ32	02/01/05	11:00	0.295	1.16	0.0342	0.511	95	226	14	71.4
NSJ32	02/04/05	9:00	0.182	1.24	0.0358	0.468	75	170	12	86.2
NSJ32	02/15/05	12:00	0.213	0.357	0.0510	0.568	60	122	6.4	81.6
NSJ32	02/16/05	12:00	12.7	0.742	0.113	4.78	140	341	55	166
NSJ32	02/17/05	11:30	0.589	0.564	0.0359	0.461	80	175	18	76.0

**Table 15 continued. Summary of Inorganic Constituents detected during the Dormant Season 2004 / 2005. No values indicate no detections or values below the quantification limit.**

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
SSJ03	01/27/05	9:50		1.92	0.0288	0.0460	47	150	27	109
SSJ03	01/27/05	14:00		1.92	0.0277	0.0501	55	168	40	59.4
SSJ03	01/27/05	18:00		1.84	0.0255	0.0441	55	161	26	63.3
SSJ03	01/28/05	8:40		0.484	0.0271	0.232	95	278	26	139
SSJ03	01/28/05	12:40	0.100	0.384	0.0255	0.244	130	255	30	127
SSJ03	01/28/05	16:40		0.342	0.0239	0.259	170	228	32	106
SSJ03	01/29/05	8:30	0.127	0.325	0.0190	0.267	160	186	28	86.3
SSJ03	01/29/05	12:30		0.316	0.0185	0.262	180	178	30	95.7
SSJ03	01/29/05	16:30		0.311	0.0183	0.264	200	186	39	125
SSJ03	01/30/05	8:30		0.192	0.0135	0.227	170	207	20	122
SSJ03	01/30/05	12:30		0.177	0.0139	0.223	170	207	21	230
SSJ03	01/30/05	16:30		0.164	0.0133	0.213	190	204	22	122
SSJ03	02/01/05	10:30		0.224	0.0119	0.168	160	175	19	84.2
SSJ03	02/04/05	10:40		0.832	0.0117	0.0693	24	164	5.6	72.5
SSJ12	01/27/05	12:00	0.723	0.596	0.0251	0.335	80	157	70	29.7
SSJ12	01/28/05	10:40	0.121	0.652	0.0154	0.142	49	140	31	79.0
SSJ12	01/29/05	10:30		0.546	0.0105	0.116	48	134	21	79
SSJ12	01/30/05	9:30		0.62	0.0105	0.101	42	128	14	85
SSJ12	02/01/05	12:00		0.852	0.0125	0.0839	24	146	6.8	94.4
SSJ12	02/04/05	11:50		0.300		0.114	150	185	13	88.2
<b>Maximum value</b>			<b>12.70</b>	<b>6.20</b>	<b>0.173</b>	<b>4.780</b>	<b>200</b>	<b>1540</b>	<b>250</b>	<b>1250</b>
<b>Median</b>			<b>0.358</b>	<b>0.443</b>	<b>0.028</b>	<b>0.091</b>	<b>26</b>	<b>138</b>	<b>20</b>	<b>80.8</b>
<b>90th percentile</b>			<b>1.074</b>	<b>1.582</b>	<b>0.068</b>	<b>0.280</b>	<b>104</b>	<b>701</b>	<b>104</b>	<b>492.6</b>
<b>Total amount of samples</b>			<b>148</b>	<b>148</b>	<b>148</b>	<b>148</b>	<b>148</b>	<b>148</b>	<b>148</b>	<b>148</b>
<b>Frequency %</b>			<b>37%</b>	<b>91%</b>	<b>49%</b>	<b>97%</b>	<b>91%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

\*\* sample should have been diluted into range of 30 - 40 NTU

**Table 16. Summary of Water Column Toxicity detected during the Dormant Season 2004 / 2005**

<b>Site ID</b>	<b>Date</b>	<b>Time</b>	<b><i>Ceriodaphnia dubia</i> 96-hour survival (in %), (*indicates significant difference to control group)</b>	<b><i>Pimephales promelas</i> 96-hour survival (in %), (*indicates significant difference to control group)</b>	<b><i>Selenastrum capricornutum</i> (Y indicates significant different growth to control group)</b>
<b>CS07</b>	01/26/05	9:20	100	100	N
CS07	01/28/05	12:20	45*	100	N
CS07	02/16/05	15:50	100	97.5	N
CS07	02/20/05	11:00	100	100	N
<b>CS15</b>	01/26/05	13:00	0*	100	Y
CS15	01/28/05	7:20	100	100	N
CS15	01/31/05	8:40	100	100	N
CS15	02/16/05	15:00	0*	100	Y
CS15	02/18/05	13:30	0*	100	Y
CS15	02/23/05	9:30	100	100	N
<b>D02</b>	01/26/05	12:20	40*	97.5	N
D02	01/28/05	14:00	100	100	N
D02	02/15/05	12:00	100	100	N
<b>FT03</b>	01/27/05	11:20	100	100	N
FT03	01/29/05	11:40	100	100	Y
<b>NS04</b>	01/26/05	13:00	100	100	N
NS04	01/28/05	10:00	95	100	N
NS04	02/16/05	12:10	100	100	N
<b>NSJ31</b>	01/27/05	11:00	100	100	N
NSJ31	01/29/05	9:00	100	95	Y
NSJ31	02/15/05	9:40	100	100	Y
NSJ31	02/17/05	10:20	95	97.5	Y
<b>SS06</b>	01/26/05	14:50	100	97.5	Y
SS06	01/28/05	10:50	100	100	Y
SS06	02/16/05	10:40	100	100	Y
SS06	02/18/05	10:00	100	95	Y
<b>SSJ03</b>	01/27/05	9:50	0*	100	N
SSJ03	01/29/05	8:40	100	100	Y
SSJ03	02/01/05	10:30	100	n/a	n/a
<b>SSJ12</b>	01/27/05	12:00	100	100	N
SSJ12	01/29/05	10:30	100	100	N
<b>Total amount of samples</b>			<b>31</b>	<b>30</b>	<b>30</b>
<b>Frequency %</b>			<b>19%</b>	<b>0%</b>	<b>40%</b>

**Table 17. Summary of Total Organic Carbon detected during the Dorman Season 2004 / 2005.**

Site ID	Date	Time	Total Organic Carbon, mg/L
<b>CS07</b>	01/26/05	16:40	1.798
CS07	01/26/05	9:20	1.778
CS07	01/27/05	8:50	1.693
CS07	01/27/05	12:20	1.328
CS07	01/27/05	16:20	1.235
CS07	01/28/05	8:20	0.765
CS07	01/28/05	12:20	0.795
CS07	01/28/05	18:20	0.699
CS07	01/29/05	8:40	0.720
CS07	01/29/05	12:40	0.647
CS07	01/29/05	16:30	0.603
CS07	01/31/05	11:50	1.684
CS07	02/03/05	12:50	2.041
CS07	02/16/05	15:50	1.374
CS07	02/20/05	11:00	1.324
<b>CS15</b>	01/26/05	13:00	4.998
CS15	01/26/05	17:50	6.258
CS15	01/26/05	7:30	3.602
CS15	01/27/05	7:20	7.278
CS15	01/27/05	13:00	7.034
CS15	01/27/05	17:20	6.478
CS15	01/28/05	7:20	2.829
CS15	01/28/05	14:20	3.620
CS15	01/28/05	18:20	3.660
CS15	01/29/05	7:20	3.435
CS15	01/29/05	13:10	3.541
CS15	01/29/05	17:50	3.515
CS15	01/31/05	8:40	7.343
CS15	02/03/05	9:50	7.729
CS15	02/16/05	7:50	3.061
CS15	02/16/05	15:00	7.005
CS15	02/17/05	7:50	6.999
CS15	02/17/05	14:10	6.235
CS15	02/18/05	13:30	4.370
CS15	02/19/05	8:50	5.429
CS15	02/23/05	9:30	4.548
<b>D01</b>	01/26/05	17:50	5.661
D01	01/27/05	10:30	2.496
D01	01/28/05	10:40	5.697
D01	01/29/05	11:00	4.226
D01	01/31/05	10:10	4.663
D01	02/03/05	11:00	6.528
D01	02/15/05	10:10	5.015
D01	02/16/05	10:00	3.669

Site ID	Date	Time	Total Organic Carbon, mg/L
<b>FT14</b>	01/29/05	14:20	3.064
FT14	01/30/05	13:00	2.623
FT14	02/01/05	14:00	2.310
FT14	02/04/05	15:20	2.265
<b>FT16</b>	01/27/05	17:10	2.510
FT16	01/29/05	8:40	2.835
FT16	01/28/05	8:50	2.480
FT16	01/30/05	8:40	2.761
FT16	02/01/05	11:20	2.558
FT16	02/04/05	11:10	2.617
<b>NS04</b>	01/26/05	13:00	3.255
NS04	01/27/05	10:40	2.553
NS04	01/28/05	10:00	1.540
NS04	01/29/05	10:20	1.363
NS04	01/31/05	9:50	2.691
NS04	02/03/05	11:10	2.414
NS04	02/16/05	12:10	2.604
<b>NSJ28</b>	01/27/05	13:00	2.444
NSJ28	01/27/05	19:10	2.361
NSJ28	01/28/05	10:00	3.676
NSJ28	01/28/05	15:00	2.220
NSJ28	01/29/05	11:00	2.808
NSJ28	01/29/05	17:00	2.450
NSJ28	01/30/05	10:00	2.734
NSJ28	01/30/05	16:00	2.770
NSJ28	02/01/05	13:00	4.673
NSJ28	02/04/05	9:50	2.661
NSJ28	02/15/05	11:00	4.135
NSJ28	02/15/05	17:00	5.590
NSJ28	02/16/05	10:50	2.793
NSJ28	02/16/05	16:50	2.748
<b>NSJ31</b>	01/27/05	11:00	4.406
NSJ31	01/27/05	17:00	4.362
NSJ31	01/28/05	9:00	4.924
NSJ31	01/28/05	14:00	5.116
NSJ31	01/29/05	9:00	4.860
NSJ31	01/29/05	15:00	4.799
NSJ31	01/30/05	8:30	4.571
NSJ31	01/30/05	14:30	4.645
NSJ31	02/01/05	9:40	4.377
NSJ31	02/15/05	9:40	3.560
NSJ31	02/15/05	15:40	3.504
NSJ31	02/16/05	9:50	3.800
NSJ31	02/16/05	15:50	3.404

Table 17 continued. Summary of Total Organic Carbon detected during the Dorman Season 2004 / 2005.

Site ID	Date	Time	Total Organic Carbon, mg/L
D02	01/26/05	12:20	7.649
D02	01/27/05	12:50	5.170
D02	01/28/05	14:00	7.915
D02	01/29/05	12:30	7.584
D02	01/31/05	12:00	7.567
D02	02/03/05	11:30	8.409
D02	02/15/05	12:00	6.637
D02	02/16/05	11:30	5.240
D03	01/26/05	16:20	13.785
D03	01/27/05	14:20	6.616
D03	01/28/05	16:50	19.728
D03	01/29/05	14:30	8.781
D03	01/31/05	13:20	8.219
D03	02/03/05	12:30	7.047
D03	02/15/05	13:20	7.116
D03	02/16/05	12:50	5.982
FT03	01/27/05	11:20	2.112
FT03	01/27/05	15:20	2.296
FT03	01/29/05	7:30	2.539
FT03	01/29/05	11:40	2.529
FT03	01/29/05	15:50	2.359
FT03	01/28/05	7:30	2.468
FT03	01/28/05	11:50	2.710
FT03	01/28/05	16:00	2.478
FT03	01/30/05	7:30	2.170
FT03	01/30/05	12:00	2.290
FT03	01/30/05	16:00	2.411
FT03	02/01/05	12:40	2.150
FT03	02/04/05	12:40	2.526

Site ID	Date	Time	Total Organic Carbon, mg/L
NSJ31	02/17/05	10:20	4.261
NSJ31	02/17/05	16:20	3.982
NSJ32	01/27/05	16:20	4.818
NSJ32	01/28/05	12:30	6.899
NSJ32	01/29/05	12:10	6.250
NSJ32	01/30/05	12:00	6.671
NSJ32	02/01/05	11:00	5.744
NSJ32	02/04/05	9:00	5.705
NSJ32	02/15/05	12:00	5.957
NSJ32	02/16/05	12:00	18.844
NSJ32	02/17/05	11:30	6.590
SSJ03	01/27/05	9:50	4.375
SSJ03	01/27/05	14:00	4.710
SSJ03	01/27/05	18:00	4.674
SSJ03	01/28/05	8:40	7.796
SSJ03	01/28/05	12:40	8.274
SSJ03	01/28/05	16:40	8.816
SSJ03	01/29/05	12:30	7.228
SSJ03	01/29/05	16:30	7.089
SSJ03	01/30/05	8:30	7.455
SSJ03	01/30/05	12:30	7.342
SSJ03	01/30/05	16:30	7.530
SSJ03	02/01/05	10:30	8.958
SSJ03	02/04/05	10:40	8.297
SSJ12	01/27/05	12:00	7.314
SSJ12	01/28/05	10:40	4.168
SSJ12	01/29/05	10:30	2.646
SSJ12	01/30/05	9:30	2.259
SSJ12	02/01/05	12:00	3.442
SSJ12	02/04/05	11:50	3.851

Maximum value	19.728
Median	3.851
90th percentile	7.574
Total amount of samples	147
Frequency %	100%

**Table 18. Summary of Trace Metals detected during the Irrigation Season 2004. No values indicate results below the RL and MDL. Units are in µg/L.**

Site ID	Date	Sample time	As	B	Cd	Co	Cu	Ni	P	Pb	Se	Zn
<b>CS03</b>	07/12/04	9:50	1.16	149		0.24	1.43	1.04	8.31	0.14	0.72	1.38
CS03	08/09/04	9:40	1.20	183			1.13	0.740	14.3	0.062	0.331	0.684
CS03	09/08/04	10:00	1.03	156			1.11	2.07	12.9	0.173		0.809
<b>CS09</b>	07/27/04	12:50	1.53	26.2	0.02		3.57	3.82	79.4	0.52		3.04
CS09	08/10/04	11:30	1.22	26.5			4.39	4.32	80.5	0.877		6.83
CS09	08/24/04	10:10	1.37	38.0			2.92	3.20	67.5	0.525		2.89
CS09	09/07/04	10:20	2.37	18.6			2.92	3.23	101	0.620		3.33
<b>CS10</b>	07/13/04	11:20	1.17	11.6	0.007	0.32	2.30	1.24	22.8	0.30		1.66
CS10	07/27/04	14:20	1.48	47.5			2.96	1.90	31.7	0.49		2.99
CS10	08/10/04	13:00	1.20	59.6			1.86	1.27	20.5	0.175		1.03
CS10	08/24/04	11:20	1.35	31.4			1.86	1.56	36.0	0.161		1.08
CS10	09/07/04	11:40	1.42	55.4			2.15	1.73	27.1	0.191		0.805
<b>CS12</b>	07/12/04	11:30	1.76	88.3	0.009	0.53	12.8	4.20	377	0.11		1.59
CS12	07/26/04	10:30	1.42	48.4			5.55	3.45	306	0.24		1.52
CS12	08/09/04	11:30	1.82	78.5			16.3	4.96	466	0.178		2.30
CS12	08/23/04	9:40	1.77	51.5			5.29	4.71	366	0.108		1.20
CS12	09/08/04	11:30	1.33	51.4			8.95	2.57	346	0.047		0.478
<b>CS13</b>	07/08/04	9:00	5.56	165	0.018	0.37	2.19	2.31	229	0.19	0.63	1.96
CS13	07/22/04	8:30	6.49	210	0.03		2.55	3.37	277	0.24	0.43	2.19
CS13	08/05/04	8:50	6.08	189	0.029		2.94	4.74	281	0.396	0.606	3.83
CS13	08/19/04	9:40	6.34	199	0.035		3.17	4.77	250	0.467	0.709	3.86
CS13	09/02/04	8:20	6.12	182	0.041		4.13	6.24	290	0.709	0.757	5.53
<b>CS15</b>	07/12/04	13:50	0.77	63.6	0.018	2.30	11.2	6.64	65.0	1.15		8.49
CS15	07/26/04	12:20	1.28	36.5	0.05		17.4	11.5	189	2.08	0.32	14.2
CS15	08/09/04	13:50	1.59	62.7			5.89	4.55	207	0.435		3.99
<b>CS21</b>	07/13/04	9:10	0.49	39.1		0.27	1.21	1.50	10.5	0.15		0.79
CS21	07/27/04	10:00	0.60	17.6			1.05	1.46	13.8	0.12		0.60
CS21	08/10/04	9:50		15.8			1.29	1.69	11.5	0.172		0.985
CS21	08/24/04	8:50	0.516	17.2			0.944	1.48	8.37	0.137		0.452
CS21	09/07/04	9:10	1.23	19.0			3.69	4.90	46.0	0.850		3.56
<b>D01</b>	07/21/04	8:40	10.1	477	0.03		4.37	4.24	1146	0.77	2.14	5.90
D01	08/03/04	9:00	4.27	347	0.02		2.25	1.52	265	0.26	2.32	1.47
D01	08/17/04	9:30	3.69	516	0.027		3.26	2.33	897	0.128	2.39	3.86
D01	08/31/04	10:00	3.49	38.4			2.96	3.37	785	0.309	1.72	2.96
<b>D02</b>	07/21/04	9:40	5.69	475	0.10		10.9	11.0	677	2.51	3.48	19.2
D02	08/03/04	10:30	6.22	383	0.08		7.35	7.30	633	1.42	3.33	10.5
D02	08/17/04	11:00	6.48	499	0.040		4.24	5.23	574	0.333	3.27	3.75
D02	08/31/04	11:20	5.68	39.7	0.045		4.24	6.02	670	0.677	2.51	5.71
D02	09/14/04	11:30	6.56	41.7	0.038		3.55	5.89	926	0.220	2.96	4.76

**Table 18 continued. Summary of Trace Metals detected during the Irrigation Season 2004. No values indicate results below the RL and MDL.**

Site ID	Date	Sample time	As	B	Cd	Co	Cu	Ni	P	Pb	Se	Zn
<b>D03</b>	07/21/04	10:50	23.8	476	0.16		17.9	19.1	1902	3.34	2.62	24.2
D03	08/03/04	13:30	7.10	368	0.07		6.26	5.97	439	1.00	2.39	6.31
D03	08/17/04	12:20	6.31	440	0.051		4.18	4.61	395	0.577	2.14	3.81
D03	08/31/04	12:20	11.8	30.6	0.066		3.73	6.51	1065	0.704	2.01	4.90
D03	09/14/04	12:50	10.7	41.2	0.048		4.16	5.93	1030	0.844	2.06	5.04
<b>FT05</b>	07/22/04	7:30	0.76	9.50	0.024	0.43	6.85	0.67	21.6	0.53		6.13
FT05	08/02/04	13:40	0.84	4.80			4.70	0.35	16.1	0.22		1.51
<b>FT08</b>	07/22/04	9:10	0.55	13.1	0.008	0.073	3.53	0.34		0.052		0.47
FT08	08/03/04	8:40	0.71	5.19			1.88	0.42		0.05		0.31
<b>FT13</b>	07/20/04	14:30	0.97	10.8	0.02		1.72	1.89	42.4	0.58		3.11
FT13	08/02/04	8:00	0.76	5.13			1.44	1.60	17.4	0.57		3.63
FT13	08/16/04	7:20	1.05	85.8	0.026		2.56	3.18	47.7	0.910		5.47
<b>FT14</b>	07/20/04	11:40	2.37	38.0	0.05		5.93	2.23	64.1	0.81	0.36	6.19
FT14	08/16/04	9:00	1.47	19.3			3.54	0.465	21.1	0.231		2.54
<b>FT15</b>	07/20/04	9:00	4.19	53.8	0.05		7.11	1.67	45.2	1.34	1.41	6.49
FT15	08/02/04	11:00	3.90	44.0	0.03		4.77	1.05	33.9	1.03	1.01	5.15
FT15	08/16/04	10:40	4.62	74.9	0.027		3.61	0.726	26.2	0.441	0.959	2.75
<b>NS04</b>	08/12/04	9:30	6.99	513			1.81	4.41	77.3	0.05		0.451
NS04	08/30/04	9:00	6.57	48.7			1.41	3.78	74.4	0.073		0.590
NS04	09/16/04	9:50	7.35	889			1.85	4.08	105	0.04		0.48
<b>NS07</b>	08/12/04	11:30	5.47	169			1.63	0.687	22.5	0.185		0.787
NS07	08/30/04	10:20	5.30	167			1.18	1.04	33.4	0.156		0.441
NS07	06/16/04	11:40	6.45	210			0.73	0.21	23.5	0.14		0.90
<b>NSJ03</b>	07/14/04	12:10	16.2	70.3			1.73	1.57	164	0.32	1.80	1.35
NSJ03	07/28/04	13:30	13.4	79.0	0.02		2.11	1.74	162	0.37	1.72	1.48
NSJ03	08/11/04	11:20	11.0	91.1			2.36	2.16	166	0.318	1.32	1.97
NSJ03	08/25/04	8:20	15.2	94.8			1.02	1.44	176	0.085	2.30	0.553
NSJ03	09/08/04	8:30	18.8	111			1.16	1.86	202	0.211	3.19	1.24
<b>NSJ06</b>	07/14/04	8:50	1.20	18.1			2.98	1.66	19.8	0.52		2.43
NSJ06	07/28/04	9:30	1.05	21.2			2.46	1.55	15.6	0.47		2.71
NSJ06	08/11/04	9:00	0.911	36.1			2.09	1.39	12.1	0.305	0.526	1.39
NSJ06	08/25/04	10:50	0.827	20.7			1.59	1.33	9.87	0.310		1.08
NSJ06	09/08/04	10:40	0.784	22.4			1.43	1.16	7.86	0.186		0.621
<b>NSJ18</b>	07/15/04	13:40	2.90	205	0.07		12.2	22.8	318	4.30	1.78	22.1
NSJ18	07/29/04	3:00	2.78	191	0.07		13.2	15.2	286	4.23	1.89	19.9
NSJ18	08/12/04	9:40	3.26	287	0.054		10.9	17.7	225	3.32	3.28	20.2
NSJ18	08/26/04	13:00	2.42	254			6.28	7.94	177	1.48	2.24	7.45
NSJ18	09/09/04	12:40	2.85	353			6.15	7.11	194	1.33	3.41	6.42
<b>NSJ24</b>	07/20/04	13:40	1.22	10.6			2.42	1.35	611	0.33	0.36	1.78
NSJ24	08/04/04	14:50	0.752	30.3			2.35	1.17	436	0.496		3.39
NSJ24	08/18/04	12:40	1.02	27.3			2.21	1.21	633	0.345		2.19
NSJ24	09/01/04	13:00	0.863	17.5			1.67	0.947	334	0.355		1.58
NSJ24	09/15/04	13:00	0.60	23.6			1.75	0.56	301	0.28		1.79

**Table 18 continued. Summary of Trace Metals detected during the Irrigation Season 2004. No values indicate results below the RL and MDL.**

<b>Site ID</b>	<b>Date</b>	<b>Sample time</b>	<b>As</b>	<b>B</b>	<b>Cd</b>	<b>Co</b>	<b>Cu</b>	<b>Ni</b>	<b>P</b>	<b>Pb</b>	<b>Se</b>	<b>Zn</b>
NSJ26	07/20/04	12:00	1.10				1.94	0.96	71.1	0.46		3.34
NSJ26	08/04/04	12:40	1.04	10.7			1.68	0.958	67.7	0.364		2.88
NSJ26	08/18/04	11:40	1.09	13.6			2.14	1.01	95.0	0.412		3.06
NSJ26	09/01/04	12:00	0.900	7.50			0.900	0.504	56.1	0.240		2.15
NSJ26	09/15/04	11:50	0.53	8.0			0.64		19.2	0.12		0.95
NSJ28	07/14/04	10:20	0.89	6.92	0.03		2.73	0.64	81.4	1.50		7.69
NSJ28	07/28/04	10:30	1.08	12.0	0.03		3.09	0.92	133	1.93		9.70
NSJ28	08/11/04	10:00	1.29	22.1	0.048		4.05	1.24	109	2.39	1.06	14.4
NSJ28	08/25/04	9:30	0.929	14.0			2.47	0.794	91.7	1.82		8.44
NSJ28	09/08/04	9:30	0.763	12.6			2.56	0.639	58.8	1.87		9.24
NSJ29	07/15/04	12:10	1.84	92.9	0.03		1.31	0.37	96.8	0.12	1.45	0.66
NSJ29	07/29/04	12:50	2.60	149	0.04		1.53	0.26	104	0.16	2.38	0.80
NSJ29	08/12/04	12:10	2.79	126	0.029		1.65	0.743	119	0.094	1.55	0.826
NSJ29	08/26/04	11:50	2.80	144			1.21	0.780	73.2	0.060	1.94	0.758
NSJ29	09/09/04	11:30	1.78	107			0.985	0.538	42.0	0.074	1.28	0.507
SS03	07/08/04	13:40	3.43	1089	0.040	3.17	8.27	22.6	154	1.73		12.6
SS03	07/22/04	14:30	3.54	1220	0.02		6.89	15.0	173	1.19	0.53	7.28
SS03	08/05/04	14:40	3.08	1483	0.024		7.28	17.8	185	1.22	0.711	9.91
SS03	08/19/04	13:30	3.54	1487	0.023		5.20	11.0	116	0.802	0.668	5.37
SS03	09/02/04	11:30	3.49	1690			6.72	14.6	160	1.36	0.904	8.23
SS04	07/27/04	15:10	3.20	93.2	0.02		5.09	4.54	70.2	0.69		3.42
SS04	08/10/04	14:00	3.14	107			4.06	4.63	77.9	0.874		4.40
SS04	08/24/04	12:50	4.21	105			3.63	3.88	111	0.437	0.583	2.43
SS07	07/08/04	11:30	2.75	850	0.009	1.05	2.55	8.37	81.2	0.44		3.42
SS07	07/22/04	12:10	2.75	823			2.17	6.20	96.4	0.38		2.29
SS07	08/05/04	12:10	3.23	926			1.30	3.12	84.4	0.118		0.878
SS07	08/19/04	12:00	3.96	1083			1.54	4.13	94.0	0.191		1.20
SS07	09/02/04	10:20	4.20	1050			1.35	4.28	98.4	0.235		0.900
SSJ01	07/22/04	12:00	1.24	46.5	0.011	0.12	6.17	0.086	23.1	0.11		0.58
SSJ01	08/03/04	11:30	1.19	33.2			4.34	0.22	20.1	0.16		0.27
SSJ01	08/17/04	9:30	1.36	76.0			3.28	0.270	25.6	0.126		0.615
SSJ08	07/29/04	9:50	7.95	215	0.12		9.66	10.2	487	3.56	1.75	25.8
SSJ08	07/15/04	9:50	7.98	225	0.09		9.37	9.91	515	2.98	2.13	23.2
SSJ08	08/12/04	14:30	8.20	226	0.088		8.51	9.84	447	2.81	1.61	21.8
SSJ08	08/26/04	10:40	7.89	328	0.061		4.76	5.08	384	1.16	1.93	9.59
SSJ08	09/09/04	10:20	8.11	362	0.052		4.36	4.25	390	0.883	2.21	7.58
SSJ12	07/20/04	10:00	0.82		0.03		4.32	3.85	105	0.88		4.68
SSJ12	08/04/04	10:20	0.567	5.29			1.72	1.28	73.4	0.268		1.73
SSJ12	08/18/04	10:50	0.788	10.0			2.67	2.16	65.0	0.575	0.582	2.93
SSJ12	09/01/04	10:20	1.09	7.30			2.70	1.93	176	0.508		1.81
SSJ12	09/15/04	9:50	0.52	5.29			1.74	0.73	14.8	0.32		1.40
<b>Maximum value</b>			23.80	1690	0.16	3.17	17.90	22.80	1902.0	4.30	3.48	25.80
<b>Median</b>			2.11	63.6	0.03	0.37	2.92	2.16	98.4	0.38	1.72	2.75
<b>90th percentile</b>			7.94	513	0.08	2.30	8.46	9.90	574.0	1.80	3.10	9.87
<b>Total amount of samples</b>			123	123	123	11	123	123	123	123	123	123
<b>Frequency in %</b>			99%	98%	44%	100%	100%	100%	98%	100%	45%	100%

**Table 18a. Summary of Trace Metals detected during the Dormant Season 2004 / 2005. No values indicate results below the RL and MDL. (Units are in µg/L)**

Site ID	Date	Sample time	Arsenic	Boron	Cadmium	Copper	Lead	Nickel	Phosphorus	Selenium	Zinc
CS15	26/Jan/2005	7:30	0.99	93.1	0.05	23.3	3.08	26.1	326		31.6
CS15	26/Jan/2005	13:00	1.25	175	0.04	11.2	1.55	14.6	231	1.10	16.6
CS15	26/Jan/2005	17:50	2.16	319	0.03	11.9	0.97	12.1	235	3.56	13.6
CS15	27/Jan/2005	7:20	1.83	448		5.02	0.47	4.45	132	2.76	5.10
CS15	27/Jan/2005	13:00	1.86	459		4.38	0.31	3.91	123	3.23	3.76
CS15	27/Jan/2005	17:20	1.86	326		4.26	0.27	3.50	112	3.03	3.37
CS15	28/Jan/2005	7:20	2.62	277	0.05	16.9	3.20	23.6	291	3.44	29.4
CS15	28/Jan/2005	14:20	1.69	129	0.04	11.7	2.48	15.5	396	1.17	23.1
CS15	28/Jan/2005	18:20	1.93	113	0.03	9.89	2.01	12.0	370	2.06	19.7
CS15	29/Jan/2005	7:20	1.70	151	0.03	9.00	1.68	11.2	278	1.74	15.3
CS15	29/Jan/2005	13:10	2.35	161		13.4	1.37	17.3	463	1.68	23.0
CS15	29/Jan/2005	17:50	1.45	171		7.51	1.21	8.75	249	0.89	11.3
CS15	31/Jan/2005	8:40	1.64	204		5.79	0.71	5.72	169	1.80	6.24
CS15	03/Feb/2005	9:50	2.17	253		7.43	0.61	7.26	170	2.58	7.81
CS15	16/Feb/2005	7:50	1.72	49.8		9.67	0.75	5.91	89.6	0.74	6.94
CS15	16/Feb/2005	15:00	3.35	242	0.04	22.6	1.84	30.2	771	3.76	29.4
CS15	17/Feb/2005	7:50	2.19	277		6.44	0.71	6.71	153	2.55	6.85
CS15	17/Feb/2005	14:10	1.75	256	0.03	7.78	0.98	8.19	132	1.39	10.6
CS15	18/Feb/2005	13:30	1.60	91	0.07	24.9	4.60	51.5	338	1.12	41.5
CS15	19/Feb/2005	8:50	2.70	119	0.04	20.1	2.12	27.2	596	2.09	33.1
CS15	23/Feb/2005	9:30	1.37	207		5.18	0.69	5.47	153	1.28	6.32
D01	26/Jan/2005	17:50	3.57	324	0.09	11.3	3.75	12.5	666	1.10	32.1
D01	27/Jan/2005	10:30	2.53	139	0.04	5.57	1.39	4.39	369	1.04	14.6
D01	28/Jan/2005	10:40	3.04	148	0.12	11.7	4.38	12.4	571	1.11	33.3
D01	29/Jan/2005	11:00	2.15	169	0.10	10.3	3.35	10.5	448	0.84	30.5
D01	31/Jan/2005	10:10	2.21	214	0.06	5.73	1.61	5.71	265	1.72	13.4
D01	03/Feb/2005	11:00	1.69	329	0.05	4.02	0.37	3.77	151	1.33	6.50
D01	15/Feb/2005	10:10	1.26	302	0.04	3.86	0.15	2.97	60.6	1.53	3.94
D01	16/Feb/2005	10:00	2.86	127	0.08	9.24	3.13	9.68	475	0.94	27.4
D02	26/Jan/2005	12:20	3.81	498	0.08	9.36	1.33	11.6	324	5.51	18.1
D02	27/Jan/2005	12:50	4.52	510	0.13	13.0	1.07	15.8	364	6.88	18.7
D02	28/Jan/2005	14:00	3.25	316	0.06	7.44	0.58	9.11	153	5.62	9.00
D02	29/Jan/2005	12:30	3.22	312	0.05	6.18	0.28	7.96	148	5.89	6.27
D02	31/Jan/2005	12:00	3.40	486	0.06	7.01	0.46	8.50	369	4.93	8.42
D02	03/Feb/2005	11:30	3.31	477	0.04	5.32	0.32	7.71	203	5.08	5.47
D02	15/Feb/2005	12:00	3.27	316	0.07	7.77	1.02	8.67	291	4.42	13.3
D02	16/Feb/2005	11:30	2.97	307	0.07	6.92	0.60	8.07	245	3.59	9.49
D03	26/Jan/2005	16:20	9.84	1280	0.12	11.4	1.22	10.2	1266	3.11	17.4
D03	27/Jan/2005	14:20	10.8	1580	0.14	12.7	1.24	11.8	1417	2.79	20.7
D03	28/Jan/2005	16:50	8.51	882	0.12	12.6	1.41	10.5	929	2.62	16.0
D03	29/Jan/2005	14:30	8.02	762	0.09	10.3	0.98	8.48	845	2.95	12.2
D03	31/Jan/2005	13:20	11.2	1210	0.13	13.3	1.64	10.8	1145	2.64	17.2
D03	03/Feb/2005	12:30	10.2	1030	0.09	10.8	1.53	8.36	887	2.72	13.8
D03	15/Feb/2005	13:20	8.17	723	0.10	12.2	1.41	8.92	586	2.09	14.4
D03	16/Feb/2005	12:50	7.82	612	0.14	13.7	2.26	11.4	554	1.65	17.7

**Table 18a continued. Summary of Trace Metals detected during the Dormant Season 2004 / 2005. No values indicate results below the RL and MDL. (Units are in µg/L)**

Site ID	Date	Sample time	Arsenic	Boron	Cadmium	Copper	Lead	Nickel	Phosphorus	Selenium	Zinc
NSJ28	27/Jan/2005	13:00	1.23	129	0.05	4.46	2.20	0.50	114		37.7
NSJ28	27/Jan/2005	19:10	1.38	141	0.05	5.22	2.22	1.62	104	0.81	38.6
NSJ28	28/Jan/2005	10:00	1.82	202	0.11	8.80	4.85	2.36	176	0.57	53.7
NSJ28	28/Jan/2005	15:00	1.82	36.3	0.07	5.09	3.67	1.52	174		40.7
NSJ28	29/Jan/2005	11:00	1.28	60.8	0.07	5.60	2.39	1.34	119		47.4
NSJ28	29/Jan/2005	17:00	1.09	33.4	0.05	4.42	1.86	1.02	125		37.1
NSJ28	30/Jan/2005	10:00	1.09	55.9	0.04	4.52	1.98	1.26	116		35.1
NSJ28	30/Jan/2005	16:00	1.18	53	0.04	4.26	1.95	1.16	113	0.59	27.0
NSJ28	01/Feb/2005	13:00	1.59	66.1	0.04	4.33	1.92	1.71	284		28.6
NSJ28	03/Feb/2005	9:50	1.25	162	0.03	3.96	2.10	1.53	132		18.0
NSJ28	15/Feb/2005	11:00	1.27	456	0.03	4.44	2.07	1.49	113		18.4
NSJ28	15/Feb/2005	17:00	1.79	423	0.11	10.6	4.10	2.85	210		59.6
NSJ28	16/Feb/2005	10:50	2.20	35	0.07	6.05	3.13	1.62	232		43.7
NSJ28	16/Feb/2005	16:50	1.63	86.2	0.07	5.60	2.66	1.42	191		41.9
SSJ12	27/Jan/2005	12:00	2.58	20.4	0.06	9.70	2.57	6.53	481	1.11	14.2
SSJ12	28/Jan/2005	10:40	1.93	16.3	0.03	4.94	0.95	3.81	176		5.17
SSJ12	29/Jan/2005	10:30	2.02	14.3		5.02	0.84	4.03	141	0.54	4.25
SSJ12	30/Jan/2005	9:30	1.80	11.1		3.65	0.40	2.96	107		2.43
SSJ12	01/Feb/2005	12:00	2.14	17.2		2.66	0.3	2.15	91.8	0.76	1.80
SSJ12	04/Feb/2005	11:50	2.21	15.9		2.18	0.26	1.87	78.6	0.92	1.43
<b>Maximum value</b>			11.20	1580.0	0.14	24.90	4.85	51.50	1417.0	6.88	59.60
<b>Median</b>			2.14	204.0	0.06	7.44	1.41	7.71	232.0	1.80	16.60
<b>90th percentile</b>			7.94	678.6	0.12	13.36	3.29	15.68	729.0	4.93	39.86
<b>Total amount of samples</b>			65	65	65	65	65	65	65	65	65
<b>Frequency in %</b>			100%	100%	78%	100%	100%	100%	100%	78%	100%

<i>MDL</i>	<i>0.1</i>	<i>0.04</i>	<i>0.01</i>	<i>0.01</i>	<i>0.01</i>	<i>0.01</i>	<i>0.01</i>	<i>2.00</i>	<i>0.1</i>	<i>0.10</i>
<i>RL</i>	<i>0.5</i>	<i>0.20</i>	<i>0.03</i>	<i>0.03</i>	<i>0.03</i>	<i>0.03</i>	<i>0.05</i>	<i>6.00</i>	<i>0.5</i>	<i>0.30</i>

**Table 19. Summary of Field Parameters taken during the Dorman Season 2004 / 2005.**  
**NA means not available**

Site ID	Date	Time	Dissolved Oxygen (mg/L)	pH	EC (µS)	Temperature in Celsius	Air Temperature in Celsius
CS07	01/26/05	9:20	15	7.58	106.8	7.9	13.8
CS07	01/26/05	16:40	11.2	7.65	106.2	10.6	13
CS07	01/27/05	8:50	11.7	7.65	93.5	8.2	11.9
CS07	01/27/05	12:20	11.1	7.5	86.9	10.1	12.3
CS07	01/27/05	16:20	11.7	7.66	88.6	10	10.9
CS07	01/28/05	8:20	11	7.51	95.6	9.3	10
CS07	01/28/05	12:20	11.3	7.72	93	9.7	14.3
CS07	01/28/05	18:20	11.5	7.77	91.8	8.7	10.3
CS07	01/29/05	8:40	12.6	7.46	96.8	7.1	6.8
CS07	01/29/05	12:40	11.2	7.38	100.2	8.9	12.2
CS07	01/29/05	16:30	11.1	7.71	96.1	9.9	13.8
CS07	01/31/05	11:50	23.1	7.91	105.6	9.1	17.9
CS07	02/03/05	12:50	11.2	7.77	115.2	9.9	21.2
CS07	02/16/05	15:50	10.8	8.42	99.4	10	15.5
CS07	02/20/05	11:00	10.6	7.37	124.2	10.9	12.4
CS15	01/26/05	7:30	NA	7.53	216	9.8	NA
CS15	01/26/05	13:00	NA	7.92	449	11.6	NA
CS15	01/26/05	17:50	NA	8.05	781	11.6	NA
CS15	01/27/05	7:20	9.6	8.02	1026	9	13.3
CS15	01/27/05	13:00	9.4	8.12	1038	10.3	13.2
CS15	01/27/05	17:20	9.7	8.14	1049	10.9	11.2
CS15	01/28/05	7:20	9.2	7.81	968	9.5	11.3
CS15	01/28/05	14:20	8	7.86	441	10.9	19.2
CS15	01/28/05	18:20	10	7.86	382	10.4	10.6
CS15	01/29/05	7:20	12.2	7.76	377	8.5	5.4
CS15	01/29/05	13:10	7.9	7.91	393	9.8	20.3
CS15	01/29/05	17:50	9.5	7.93	409	11	11
CS15	01/31/05	8:40	10.6	7.86	580	6.6	6.8
CS15	02/03/05	9:50	7	7.71	672	7.8	11.6
CS15	02/16/05	7:50	9.3	7.58	199	11.1	12.6
CS15	02/16/05	15:00	9.9	8.13	779	12.7	12.5
CS15	02/17/05	7:50	10.3	8.11	960	10.7	11.6
CS15	02/17/05	14:10	8.2	8.19	815	13	19
CS15	02/18/05	13:30	9	7.85	284	13.6	16
CS15	02/19/05	8:50	9	7.67	371	12.6	12.9
CS15	02/23/05	9:30	9.8	8.03	564	11.2	11.9
D01	01/26/05	17:50	11.1	7.12	938	10.4	11.2
D01	01/27/05	10:30	7.7	6.99	311	10	14
D01	01/28/05	10:40	7.1	7.09	290	11.3	13.8
D01	01/29/05	11:00	7.9	6.74	252	8.6	8
D01	01/31/05	10:10	3.9	6.66	505	8.5	14.1
D01	02/03/05	11:00	3.6	6.63	791	9.1	16.5
D01	02/15/05	10:10	5.5	6.81	991	12.1	15.1
D01	02/16/05	10:00	9.2	7.06	543	12.5	11.4

**Table 19 continued. Summary of Field Parameters taken during the Dorman Season 2004 / 2005. NA means not available**

<b>Site ID</b>	<b>Date</b>	<b>Time</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>pH</b>	<b>EC (µS)</b>	<b>Temperature in Celsius</b>	<b>Air Temperature in Celsius</b>
<b>D02</b>	01/26/05	12:20	5.3	6.96	2370	13.5	13.3
D02	01/27/05	12:50	6.3	6.92	2410	11.7	12
D02	01/28/05	14:00	5.8	7.12	2680	11.8	15.2
D02	01/29/05	12:30	7.9	6.9	2470	9.7	8.6
D02	01/31/05	12:00	6	6.84	2330	10	12.9
D02	02/03/05	11:30	5.2	6.7	1916	9	12.9
D02	02/15/05	12:00	9.9	7.15	1805	13.1	12.4
D02	02/16/05	11:30	10.5	7.16	1833	13.3	14.9
<b>D03</b>	01/26/05	16:20	1.2	6.86	1892	13.6	13.4
D03	01/27/05	14:20	5	6.75	1962	11	12
D03	01/28/05	16:50	4.3	7.06	2060	13.3	11.5
D03	01/29/05	14:30	4.5	6.91	1913	12.7	15.8
D03	01/31/05	13:20	4.1	6.7	1815	12.7	16.9
D03	02/03/05	12:30	2.9	6.85	1939	11.5	17.9
D03	02/15/05	13:13	4.3	6.98	1903	13.7	12.6
D03	02/16/05	12:50	7.2	6.93	1627	14	14.3
<b>FT03</b>	01/27/05	11:20	10.3	7.52	105.4	11.4	13.8
FT03	01/27/05	15:20	1.6	7.71	107.7	11.7	17.1
FT03	01/28/05	7:30	7.7	7.08	107.4	10.9	15.2
FT03	01/28/05	11:50	10	7.49	108.1	11.3	12.1
FT03	01/28/05	16:00	10.6	7.71	108.6	11.4	11.3
FT03	01/29/05	7:30	9.7	7.02	107.2	9.4	10.1
FT03	01/29/05	11:40	10.6	7.57	105.2	10.3	13.5
FT03	01/29/05	15:50	10.6	7.8	108.4	10	10.9
FT03	01/30/05	7:30	8.5	7.02	104.2	8.3	12.9
FT03	01/30/05	12:00	9	8.02	104.3	10.3	16.2
FT03	01/30/05	16:00	9.9	8.06	108.1	11.2	15.2
FT03	02/01/05	12:40	10	8.37	100.4	11.5	14.5
FT03	02/04/05	12:40	3.8	8.93	120.3	15.2	30.7
<b>FT14</b>	01/29/05	14:20	9.4	0.2	157.8	10.7	12.1
FT14	01/30/05	13:00	9	7.61	149.2	11	13.7
FT14	02/01/05	14:00	8.2	7.3	132	11.8	17.5
FT14	02/04/05	15:20	7.4	8.94	121.5	15.1	22.3
<b>FT16</b>	01/27/05	17:10	10.3	7.82	187	12.3	14.1
FT16	01/28/05	8:50	9.6	7.39	183.9	11.5	14.7
FT16	01/29/05	8:40	10.6	7.34	179	9.5	7.7
FT16	01/30/05	8:40	10.4	7.56	190	8.7	9.1
FT16	02/01/05	11:20	10.2	8.42	199	10.2	15
FT16	02/04/05	11:10	8.6	9.03	199.5	11.1	22.2

**Table 19 continued. Summary of Field Parameters taken during the Dorman Season 2004 / 2005. NA means not available**

<b>Site ID</b>	<b>Date</b>	<b>Time</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>pH</b>	<b>EC (µS)</b>	<b>Temperature in Celsius</b>	<b>Air Temperature in Celsius</b>
<b>NS04</b>	01/26/05	13:00	10.4	7.54	183.8	11.2	13.2
NS04	01/27/05	10:40	10.2	7.27	94.1	9.8	10.3
NS04	01/28/05	10:00	10.4	7.39	94.8	9.8	10.5
NS04	01/29/05	10:20	18.7	7.37	107	8.6	8.6
NS04	01/31/05	9:50	11.1	7.4	131.3	7.3	12.5
NS04	02/03/05	11:10	9.7	7.55	163.4	9.2	14.3
NS04	02/16/05	12:10	9.6	7.95	195.7	11.7	16
<b>NSJ28</b>	01/27/05	13:00	8	6.99	93.7	11.6	12.6
NSJ28	01/27/05	19:10	12.6	6.7	93.5	11.3	11.4
NSJ28	01/28/05	10:00	8.4	6.79	157.1	10.8	11.7
NSJ28	01/28/05	15:00	8.6	7.09	64.2	11.4	13.9
NSJ28	01/29/05	11:00	8.5	6.83	109.9	9.6	9.3
NSJ28	01/29/05	17:00	9.4	7.1	83.3	10.6	13.2
NSJ28	01/30/05	10:00	9.3	6.88	127.3	8.4	8.9
NSJ28	01/30/05	16:00	8.9	7.25	126.4	11.5	15.5
NSJ28	02/01/05	13:00	5.1	7.09	175.7	9.9	17.8
NSJ28	02/04/05	9:50	6.8	7.07	161.2	8.8	15.4
NSJ28	02/15/05	11:00	11.8	6.89	193	11.7	12.1
NSJ28	02/15/05	17:00	6.7	7.02	174.1	12.7	14.2
NSJ28	02/16/05	10:50	6.7	6.9	72.7	13.1	15.6
NSJ28	02/16/05	16:50	7.5	7.09	70.1	14.4	16
<b>NSJ31</b>	01/27/05	11:00	9.6	6.7	112.6	9	13.9
NSJ31	01/27/05	17:20	9.7	6.56	112.5	9.5	13
NSJ31	01/28/05	9:00	10	7.05	113.8	9.7	11.5
NSJ31	01/28/05	14:00	9.8	7.37	117	10.5	12.9
NSJ31	01/29/05	9:00	8.7	6.69	116	8.8	9.5
NSJ31	01/29/05	15:00	9.5	7.3	106.4	9.6	10.5
NSJ31	01/30/05	8:30	11	6.96	106	7.5	8.5
NSJ31	01/30/05	14:30	10.2	7.37	103.2	10.1	12.9
NSJ31	02/01/05	9:40	11.7	7.41	117.4	6.7	9.8
NSJ31	02/15/05	9:40	9.9	7.7	231	11.6	13.6
NSJ31	02/15/05	15:40	11.3	8.7	222	12.9	14
NSJ31	02/16/05	9:50	9.2	7.63	236	12.6	14.7
NSJ31	02/16/05	15:50	6.8	8.52	228	14.2	19
NSJ31	02/17/05	10:20	10.1	7.56	120.3	13.3	15.1
NSJ31	02/17/05	16:20	10.4	8.18	105.3	13.8	14.6

**Table 19 continued. Summary of Field Parameters taken during the Dorman Season 2004 / 2005. NA means not available**

<b>Site ID</b>	<b>Date</b>	<b>Time</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>pH</b>	<b>EC (µS)</b>	<b>Temperature in Celsius</b>	<b>Air Temperature in Celsius</b>
NSJ32	01/27/05	16:20	8	7.04	188.7	11.7	15
NSJ32	01/28/05	12:30	7.8	7.25	199.9	10.3	13.5
NSJ32	01/29/05	12:10	8.4	7.25	168.7	9.6	10.5
NSJ32	01/30/05	12:00	9.4	7.28	194	8.8	9.8
NSJ32	02/01/05	11:00	10.9	7.3	197	8.7	12
NSJ32	02/04/05	9:00	7.8	7.2	217	9.9	20.9
NSJ32	02/15/05	12:00	9.7	7.71	239	12.8	14.2
NSJ32	02/16/05	12:00	9.5	7.59	616	13	15.5
NSJ32	02/17/05	11:30	7.7	7.35	217	13.1	14
SS03	01/28/05	10:50	8.3	7.23	101	9.6	16.9
SS06	01/26/05	14:50	1.6	7.29	80.9	13	15.1
SS06	01/27/05	10:20	8	7.1	101.7	9.9	12.9
SS06	01/28/05	10:50	8.3	7.23	101	9.6	16.9
SS06	01/29/05	10:00	9.1	7.09	92.9	9.7	7.7
SS06	01/31/05	12:20	9.8	7.05	92	9.7	9.9
SS06	02/03/05	11:40	7.6	7.09	92.1	9.1	11.9
SS06	02/16/05	10:40	9.5	7.2	106.1	10.9	12.8
SS06	02/17/05	10:20	8.4	7.16	110.4	12	13.6
SS06	02/18/05	10:00	15.2	6.95	106.5	11.6	14.1
SSJ03	01/27/05	9:50	9.8	7.45	202	9.4	17
SSJ03	01/27/05	14:00	10	7.38	208	10.5	14.5
SSJ03	01/27/05	18:00	10.4	7.23	245	11.4	15.5
SSJ03	01/28/05	8:40	5.1	8.12	385	10.5	13.5
SSJ03	01/28/05	12:40	10	7.8	334	12	16.5
SSJ03	01/28/05	16:40	10.2	7.95	273	12.2	13.5
SSJ03	01/29/05	8:30	10	7.75	202	8.5	10.2
SSJ03	01/29/05	12:30	10	7.75	194	10.8	11.2
SSJ03	01/29/05	16:30	10.6	11.4	184	9.8	11.4
SSJ03	01/30/05	8:30	10.2	7.75	237	9.8	9.7
SSJ03	01/30/05	12:30	10.6	7.67	226	10.8	11.1
SSJ03	01/30/05	16:30	10	7.75	207	12	12.5
SSJ03	02/01/05	10:30	10.4	7.38	195	8	12
SSJ03	02/04/05	10:40	9.8	7.47	217	8.4	12.8
SSJ12	01/27/05	12:00	7.1	7.15	312	12	14.9
SSJ12	01/28/05	10:40	9.7	7.5	301	11.5	15
SSJ12	01/29/05	10:30	10.2	7.75	239	11	15
SSJ12	01/30/05	9:30	10.2	7.94	275	10.5	11.2
SSJ12	02/04/05	11:50	10.8	7.48	289	8.6	15.2
<b>Maximum value</b>			<b>23.1</b>	<b>11.4</b>	<b>2680</b>	<b>15.2</b>	<b>30.7</b>
<b>Minimum value</b>			<b>1.2</b>	<b>6.6</b>	<b>64</b>	<b>6.6</b>	<b>5.4</b>
<b>Median</b>			<b>9.6</b>	<b>7.4</b>	<b>190</b>	<b>10.6</b>	<b>13.2</b>
<b>90th percentile</b>			<b>11.2</b>	<b>8.1</b>	<b>1280</b>	<b>13.0</b>	<b>16.9</b>
<b>Total amount of samples</b>			<b>157</b>				

## QA/QC SAMPLES

One hundred fifty-seven water samples were collected for organochlorine, organophosphate and pyrethroid pesticides. In addition to the 157 samples, eight field duplicates and eight field blanks were collected for organochlorines, organophosphates, and pyrethroids. Concentrations of organochlorines in the field duplicates were within 25%. The eight field blanks also indicated no contaminations (Table 21 Appendix I). Out of the eight field duplicates for organophosphates, no RPD value exceeded 25%. None of the eight field blanks had measurable quantities of organophosphate compounds (Table 22 Appendix I). None of the eight pyrethroid field duplicates had RPD values over 25%. One of the eight field blanks showed detections of the pyrethroid cypermethrin-1 to -4 (Table 23 Appendix I). No pyrethroid was detected in the associated field sample. It is the assumption that the two samples might have been switched. Four field duplicates and one field blank were collected for herbicides. All RPD values were below 25%, the field blank had no detections (Table 24 Appendix I). For the three pesticide groups and herbicides, 27 matrix spike samples were collected. Mean percent recoveries ranged from 88% to 110%, well within the QA targets for analysis.

One hundred forty-eight samples were collected for hardness, nutrients and physical parameters. In addition, twenty-two field duplicates were analyzed for all constituents. None of the duplicate samples had relative percent differences greater than 25%.

Eight field blanks were analyzed for hardness. No hardness was measured in any blank. Fourteen field blanks were collected for physical parameters and nutrients. Five parameters were detectable but not quantifiable; all other concentrations were below the detection limit. The field blank SSJ12 from February 4 (11:51 am) indicates detections that almost match the results of the environmental sample SSJ12 from February 4 (11:50 am). The sampling crew doesn't recall the sampling event, but it is assumed that the sample was mistakenly collected as a field duplicate instead of a field blank. The sample received the qualifier code IP (analyte detected in method, trip or equipment blank) (Table 24 Appendix I).

The mean matrix spike recovery rate and standard deviation for the seven samples collected for color is  $92.2 \pm 5.7$ . Eight matrix spike samples were analyzed for nutrients. The mean recovery rates and standard deviations for ammonia are  $99.4 \pm 4.1$ , for nitrate and nitrite are  $97.4 \pm 1.5$ , for nitrite is  $98.5 \pm 0.6$  and for orthophosphate is  $99.0 \pm 1.2$ .

Two field blanks and one field duplicate were collected for the 31 water column toxicity samples. No significantly different survival rates or algal cell numbers were seen in the two blank samples in comparison to their control groups. The field duplicate sample and the original environmental sample exhibited significantly different algae cell numbers from the laboratory control, but were not significantly different from each other. There was no significantly different survival detected for the water flea or the fathead minnow in the environmental sample and the duplicate.

One hundred forty-seven water samples were analyzed for total organic carbon and 23 additional samples were collected for quality control (Table 25 Appendix I). None of the nine duplicate samples showed relative percent differences higher than 25%. Four of the seven blank samples showed values between the detection limit and the rating limit. The mean recovery rate and standard deviation for the seven collected matrix spike samples is  $121 \pm 15.38$ .

One hundred twenty-three water samples were collected for trace metals during the Irrigation Season 2004 (Table 26 Appendix I). Seven field duplicates were also collected. Four of the field duplicates had RPD's over 25%, and the qualifier code FDP (field duplicate RPD above QC limit) was given to the environmental sample and the field duplicates in the database.

Six blanks were prepared with MilliQ-water, three of those as field blanks and three as travel blanks. Five of six field blanks had detections of several trace metals. The qualifier code IP (analyte detected in method, trip or equipment blank) was given to those blank samples in the database. There is no pattern for the contamination excluding the MilliQ water as source of the contamination. Since both travel and field blanks show detections and several different individuals filled sample containers, it is unlikely that the field crews contaminated the samples. Travel blanks were filled in a clean room at the UC Davis Laboratory for Plasma Mass Spectroscopy with minimal chance of contamination. We suspect the source of the contamination is a result of the reuse of improperly cleaned metal sample containers.

Nine matrix spike samples were analyzed for all metals except cobalt. The mean recovery rates and standard deviations for the different trace metals are as follows:  
As  $106.0 \pm 3.1$ , B  $104.1 \pm 13.4$ , Cd  $110.5 \pm 4.8$ , Cu  $101.1 \pm 6.7$ , Ni  $102.2 \pm 3.8$ , P  $103.2 \pm 9.8$ , Pb  $103.4 \pm 2.4$ , Se  $102.8 \pm 5.8$ , Zn  $107.8 \pm 7.7$ . The lab analyzed one matrix spike for cobalt and the mean recovery rate was 100%.

During the Dormant Season 2004 / 2005, 65 samples were collected for trace metal analyses. The samples were collected and acidified by UCD and delivered to the Department of Fish & Game Marine Pollution Studies Laboratory in Moss Landing after each storm event. Three field and travel blanks and four field duplicates were collected for analysis.

Three of the four field duplicates showed RPD's greater than 25% for seven metals (Table 28, Appendix I). The qualifier code FDP was given to the environmental sample and the field duplicates in the database.

The two field blanks and one travel blank had 12 metal detections. Sixteen metals were found as contaminations in the 4 acidification blanks. The contaminations in the blank samples are primarily boron, copper, nickel, phosphorus and zinc. The qualifier code IP (analyte detected in method, trip or equipment blank) was given to those blank samples in the database.

Four matrix spike samples were analyzed for all trace metals. The mean recovery rates and standard deviations for the different metals are as follows: As  $96 \pm 3.7$ , B  $105 \pm 5.0$ , Cd  $112 \pm 2.5$ , Cu  $101 \pm 6.7$ , Pb  $96 \pm 5.7$ , Ni  $98 \pm 6.4$ , P  $100 \pm 5.4$ , Se  $94 \pm 5.6$  and Zn  $106 \pm 6.1$ .

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## **Appendix I. Quality Assurance / Quality Control tables**

Table 20. Mean percent recoveries and standard deviations of percent recoveries for pesticide quality assurance matrix spike and matrix spike duplicates

Table 21. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 /2005. Organochlorine Pesticides

Table 22. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 /2005. Organophosphate Pesticides

Table 23. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 /2005. Pyrethroids

Table 24. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 /2005. Herbicides

Table 25. Summary of Nutrients, Physical Parameters and Harness Field QA / QC data for the Dormant Season 2004 / 2005

Table 26. Summary of TOC Field QA / QC data for the Dormant Season 2004 / 2005

Table 27. Summary of Metal Field QA / QC data for the Irrigation Season 2004

Table 28. Summary of Metal Field QA / QC data for the Dormant Season 2004 / 2005

**Table 20. Mean percent recoveries and standard deviations of percent recoveries for pesticide quality assurance matrix spikes and matrix spike duplicates**

<b>Organochlorine Pesticides by GC/ECD; 14 MS/MSD samples analyzed, 6 samples received qualifier code H</b>	<b>MS/MSD Mean (in %)</b>	<b>Standard deviation</b>	<b>SWAMP Qualifier Code additions</b>
DDD(o,p')	92.8	8.4	1 of 14 samples GB
DDD(p,p')	97.7	11.7	
DDE(o,p')	93.5	8.4	
DDE(p,p')	101.8	8.1	
DDT(o,p')	94.7	10.0	
DDT(p,p')	107.0	13.4	1 of 14 samples GB
Dicofol	104.1	12.6	
Dieldrin	91.3	9.8	
Endrin	110.0	12.1	
Methoxychlor	106.2	11.2	
<b>Organophosphate Pesticides by GC/FPD; 16 MS/MSD samples analyzed, 2 samples received qualifier code H</b>	<b>MS/MSD Mean (in %)</b>	<b>Standard deviation</b>	<b>SWAMP Qualifier Code additions</b>
Azinphos methyl	99.1	11.6	
Chlorpyrifos	103.4	7.3	
Diazinon	99.7	11.7	1 of 16 samples GB
Dimethoate	99.1	10.6	2 of 16 samples GB
Disulfoton	89.5	8.9	2 of 16 samples GB
Malathion	105.9	9.0	5 of 16 samples GB
Methidathion	105.9	11.1	
Parathion, Methyl	104.3	12.1	
Phorate	92.7	9.7	
Phosmet	99.8	14.4	
<b>Parathion, Ethyl</b>	NA	NA	
<b>Pyrethroid Pesticides by GC/ECD; 16 MS/MSD samples analyzed, 2 samples received qualifier code H</b>	<b>MS/MSD Mean (in %)</b>	<b>Standard deviation</b>	<b>SWAMP Qualifier Code additions</b>
Bifenthrin	97.3	10.1	1 of 16 samples GB
Cyfluthrin-1	102.9	13.6	
Cyfluthrin-2	99.5	13.2	
Cyfluthrin-3	97.5	10.7	2 of 16 samples GB
Cyfluthrin-4	90.5	11.1	1 of 16 samples GB
Cypermethrin-1	95.2	11.7	1 of 16 samples GB
Cypermethrin-2	99.3	13.1	1 of 16 samples GB
Cypermethrin-3	97.7	14.2	1 of 16 samples GB
Cypermethrin-4	96.7	15.1	1 of 16 samples GB
Deltamethrin	97.3	16.0	
Esfenvalerate/Fenvalerate-1	105.9	11.4	
Esfenvalerate/Fenvalerate-2	102.4	14.7	
Permethrin-1	91.9	11.1	1 of 16 samples GB
Permethrin-2	94.3	10.0	
Lambda cyhalothrin-1	99.4	12.6	
Lambda cyhalothrin-2	99.3	11.6	
<b>Herbicides by GC/TSD; 8 MS/MSD samples analyzed, 2 samples received qualifier code H</b>	<b>MS/MSD Mean (in %)</b>	<b>Standard deviation</b>	<b>SWAMP Qualifier Code additions</b>
Atrazine	91.7	9.6	1 of 8 samples GB
Cyanazine	89.4	4.7	2 of 8 samples GB
Molinate	88.7	10.6	
Simazine	98.2	7.6	
Thiobencarb	100.2	14.2	

GB = Matrix spike recovery not within control limits  
H = A holding time violation has occurred

**Table 21. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 / 2005 (in µg/L).  
Organochlorine Pesticides**

	Site ID	Collection Date	Collection Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor
<b>Field Duplicates</b>													
Concentration in ppb (µg/L)	SS06	01/27/05	10:20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	SS06	01/27/05	10:23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
Concentration in ppb (µg/L)	FT16	01/27/05	17:10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT16	01/27/05	17:13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
Concentration in ppb (µg/L)	NSJ28	01/27/05	13:00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ28	01/27/05	13:01*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
Concentration in ppb (µg/L)	D01	01/28/05	10:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	D01	01/28/05	10:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
Concentration in ppb (µg/L)	NS04	01/29/05	10:20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NS04	01/29/05	10:23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
Concentration in ppb (µg/L)	FT03	02/04/05	12:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT03	02/04/05	12:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
Concentration in ppb (µg/L)	NSJ31	02/15/05	9:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ31	02/15/05	9:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
Concentration in ppb (µg/L)	CS15	02/17/05	7:50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	CS15	02/17/05	7:53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>													
<b>Field Blanks</b>													
Concentration in ppb (µg/L)	D03	01/28/05	16:51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT03	01/28/05	11:51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	CS07	01/29/05	8:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	D02	01/31/05	12:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT14	02/04/05	15:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	D01	02/15/05	10:11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ28	02/15/05	11:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ32	02/16/05	12:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

\* Sample was marked as a Field Blank, but sampled as a Field Duplicate

**Table 22. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 / 2005 (in µg/L).  
Organophosphate Pesticides**

	Site ID	Collection Date	Collection Time	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Methyl	Phorate	Phosmet	Parathion, Ethyl
<b>Field Duplicates</b>														
Concentration in ppb (µg/L)	SSJ12	01/27/05	12:00	ND	ND	0.015	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	SSJ12	01/27/05	12:03	ND	ND	0.012	ND	ND	ND	ND	ND	ND	ND	ND
RPD						22								
Concentration in ppb (µg/L)	NSJ32	01/28/05	12:30	ND	0.014	1.100	ND	ND	0.085	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ32	01/28/05	12:33	ND	ND	1.080	ND	ND	0.095	ND	ND	ND	ND	ND
RPD						2			11					
Concentration in ppb (µg/L)	NS04	01/28/05	10:00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NS04	01/28/05	10:03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD														
Concentration in ppb (µg/L)	SSJ03	01/30/05	8:30	ND	0.021	0.021	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	SSJ03	01/30/05	8:33	ND	0.018	0.020	ND	ND	ND	ND	ND	ND	ND	ND
RPD					17	2								
Concentration in ppb (µg/L)	FT14	01/30/05	13:00	ND	0.0128	0.017	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT14	01/30/05	13:03	ND	0.0152	0.016	ND	ND	ND	ND	ND	ND	ND	ND
RPD					17	6								
Concentration in ppb (µg/L)	SS06	01/31/05	12:20	ND	ND	0.142	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	SS06	01/31/05	12:23	ND	ND	0.137	ND	ND	ND	ND	ND	ND	ND	ND
RPD						4								
Concentration in ppb (µg/L)	CS15	02/03/05	9:50	ND	0.011	0.040	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	CS15	02/03/05	9:53	ND	0.011	0.037	ND	ND	ND	ND	ND	ND	ND	ND
RPD					0	8								
Concentration in ppb (µg/L)	D02	02/15/05	12:00	ND	ND	0.023	ND	0.158	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	D02	02/15/05	12:03	ND	ND	0.022	ND	0.149	ND	ND	ND	ND	ND	ND
RPD						4		6						
<b>Field Blanks</b>														
Concentration in ppb (µg/L)	D03	01/26/05	16:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	CS15	01/27/05	7:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	D02	01/28/05	14:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT03	01/29/05	7:31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT16	01/30/05	8:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ28	02/01/05	13:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	SS06	02/16/05	10:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ31	02/16/05	9:51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 23. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 / 2005 (in µg/L).

## Pyrethroids

	Site ID	Collection Date	Collection Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	Deltamethrin	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2	Lambda cyhalothrin-1	Lambda cyhalothrin-2
<b>Field Duplicates</b>																			
Concentration in ppb (µg/L)	NS04	01/26/05	13:00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NS04	01/26/05	13:03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>																			
Concentration in ppb (µg/L)	NSJ31	01/27/05	11:00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ31	01/27/05	11:01*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>																			
Concentration in ppb (µg/L)	NSJ28	01/28/05	10:00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ28	01/28/05	10:01*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>																			
Concentration in ppb (µg/L)	D01	01/28/05	10:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	D01	01/28/05	10:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>																			
Concentration in ppb (µg/L)	CS07	01/29/05	8:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	CS07	01/29/05	8:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>																			
Concentration in ppb (µg/L)	SSJ03	02/01/05	10:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	SSJ03	02/01/05	10:33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>																			
Concentration in ppb (µg/L)	D03	02/03/05	12:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	D03	02/03/05	12:33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>RPD</b>																			
Concentration in ppb (µg/L)	SS06	02/16/05	10:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.061
Concentration in ppb (µg/L)	SS06	02/16/05	10:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.063
<b>RPD</b>																			3
<b>Field Blanks</b>																			
Concentration in ppb (µg/L)	CS15	01/28/05	7:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT14	01/30/05	13:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT03	02/01/05	12:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT16	02/04/05	11:11	ND	ND	ND	ND	ND	0.101**	0.104**	0.105**	0.106**	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NSJ31	02/15/05	9:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	NS04	02/16/05	12:11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	CS15	02/17/05	7:51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	CS15	02/23/05	9:31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

\* Sample was marked as a Field Blank, but sampled as a Field Duplicate

\*\* IP- analyte detected in method, trip or equipment blank

**Table 24. Summary of Pesticide Field QA / QC data for the Dormant Season 2004 / 2005 (in µg/L).**

<b>Herbicides</b>								
	Site ID	Collection Date	Collection Time	Atrazine	Cyanazine	Molinate	Simazine	Thiobencarb
<b>Field Duplicates</b>								
Concentration in ppb (µg/L)	NSJ28	01/27/05	13:00	0.286	ND	ND	0.278	ND
Concentration in ppb (µg/L)	NSJ28	01/27/05	13:01*	0.288	ND	ND	0.276	ND
RPD				1			1	
Concentration in ppb (µg/L)	FT16	01/28/05	8:50	ND	ND	ND	0.034	ND
Concentration in ppb (µg/L)	FT16	01/28/05	8:53	ND	ND	ND	0.037	ND
RPD							7	
Concentration in ppb (µg/L)	SSJ03	01/30/05	8:30	0.016	ND	ND	0.682	ND
Concentration in ppb (µg/L)	SSJ03	01/30/05	8:33	0.018	ND	ND	0.692	ND
RPD				12			1	
Concentration in ppb (µg/L)	FT14	02/04/05	15:20	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	FT14	02/04/05	15:23	ND	ND	ND	ND	ND
RPD								
<b>Field Blanks</b>								
Concentration in ppb (µg/L)	NSJ32	02/01/05	11:01	ND	ND	ND	ND	ND

\* Sample was marked as a Field Blank, but sampled as a Field Duplicate

**Table 25. Summary of Nutrients, Physical Parameter and Hardness Field QA / QC data for the Dormant Season 2004 / 2005**

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
<b>DUPLICATES</b>										
D02	01/26/05	12:20								693
D02	01/26/05	12:23								703
<b>RPD</b>										<b>1</b>
CS07	01/26/05	9:20	ND	0.0348	ND	0.0096 DNQ				
CS07	01/26/05	9:23	ND	0.0346	ND	0.0100 DNQ				
<b>RPD</b>				<b>1</b>						
D01	01/27/05	10:30	0.130	0.642	0.0310	0.201				
D01	01/27/05	10:33	0.129	0.636	0.0317	0.207				
<b>RPD</b>			<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>				
SSJ03	01/27/05	9:50					47	150	27	
SSJ03	01/27/05	9:53					46	143	27	
<b>RPD</b>							<b>2</b>	<b>5</b>	<b>0</b>	
NSJ31	01/28/05	09:00					95	147	70	
NSJ31	01/28/05	09:03					85	146	70	
<b>RPD</b>							<b>11</b>	<b>1</b>	<b>0</b>	
NSJ31	01/28/05	09:00	0.056 DNQ	0.862	0.0096 DNQ	0.1210				
NSJ31	01/28/05	09:01*	0.048 DNQ	0.806	0.0082 DNQ	0.1190				
<b>RPD</b>				<b>7</b>		<b>2</b>				
NS04	01/28/05	10:00					27	73	5.2	
NS04	01/28/05	10:03					29	77	5.2	
<b>RPD</b>							<b>7</b>	<b>5</b>	<b>0</b>	
CS07	01/28/05	12:20								36.4
CS07	01/28/05	12:23								35.4
<b>RPD</b>										<b>3</b>
SSJ03	01/28/05	8:40								139
SSJ03	01/28/05	8:43								137
<b>RPD</b>										<b>1</b>
SSJ12	01/29/05	10:30	0.062 DNQ	0.546	0.0105	0.116				
SSJ12	01/29/05	10:33	0.062 DNQ	0.546	0.0108	0.115				
<b>RPD</b>				<b>0</b>	<b>3</b>	<b>1</b>				
NS04	01/29/05	10:20	ND	0.0404	ND	0.0271				
NS04	01/29/05	10:23	ND	0.0406	ND	0.0268				
<b>RPD</b>				<b>0</b>		<b>1</b>				

**Table 25 continued. Summary of Nutrients, Physical Parameter and Hardness Field QA / QC data for the Dormant Season 2004 / 2005.**

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
CS15	01/29/05	7:20					75	362	130	
CS15	01/29/05	7:23					60	362	130	
RPD							22	0	0	
FT14	01/30/05	13:00					22	98	19	
FT14	01/30/05	13:03					20	101	20	
RPD							10	3	5	
FT16	01/30/05	8:40								73.4
FT16	01/30/05	8:43								79.6
RPD										8
D03	01/31/05	13:20	1.02	1.28	0.0655	0.182				
D03	01/31/05	13:23	1.18	1.24	0.0658	0.170				
RPD			15	3	0	7				
D01	01/31/05	10:10								224
D01	01/31/05	10:13								245
RPD										9
SSJ12	02/01/05	12:00					24	146	6.8	
SSJ12	02/01/05	12:03					26	146	6.7	
RPD							8	0	1	
CS07	02/03/05	12:50					4 DNQ	79	0.80	
CS07	02/03/05	12:53					3 DNQ	75	0.85	
RPD								5	6	
SSJ03	02/04/05	10:40	0.042 DNQ	0.832	0.0117	0.0693				
SSJ03	02/04/05	10:43	ND	ND	ND	ND				
RPD										
FT03	02/04/05	12:40								45.7
FT03	02/04/05	12:43								42.5
RPD										7
D03	02/15/05	13:20								571
D03	02/15/05	13:23								612
RPD										7
NSJ32	02/17/05	11:30					80	175	18	
NSJ32	02/17/05	11:33					75	179	19	
RPD							6	2	5	

**Table 25 continued. Summary of Nutrients, Physical Parameter and Hardness Field QA / QC data for the Dormant Season 2004 / 2005.**

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
BLANKS										
CS07	01/26/05	9:21					ND	ND	0.05 DNQ	
NS04	01/27/05	10:41								ND
FT16	01/27/05	17:11								ND
D03	01/28/05	16:51								ND
SSJ12	01/29/05	10:31					ND	ND	ND	
CS15	01/29/05	7:21								ND
D01	01/29/05	11:01	0.049 DNQ	ND	ND	ND				
D02	01/29/05	12:31					ND	ND	ND	
SSJ12	01/30/05	9:31								ND
NS04	01/31/05	9:51					2 DNQ	ND	ND	
NSJ32	02/01/05	11:01	ND	ND	ND	ND				
FT14	02/01/05	14:01								ND
NS04	02/03/05	11:11	ND	ND	ND	ND				
SSJ12	02/04/05	11:51	ND	0.300**	0.0085 DNQ**	0.113**				
FT16	02/04/05	11:11					ND	ND	0.05DNQ	
D01	02/15/05	10:11								ND
D01	02/16/05	10:01					ND	ND	0.05DNQ	
D03	02/16/05	12:51	ND	ND	ND	ND				
CS15	02/16/05	7:51					ND	ND	ND	
NSJ31	02/16/05	9:51	ND	ND	ND	ND				
CS07	02/16/05	15:51	ND	ND	ND	ND				
NSJ32	02/17/05	11:31								ND
* Sample was marked as a Field Blank, but sampled as a Field Duplicate										
** IP- analyte detected in method, trip or equipment blank										

**Table 26. Summary of TOC Field QA / QC data for the Dormant Season 2004 / 2005**

	Site ID	Collection Date	Collection Time	TOC in mg/L
<b>Field Duplicates</b>				
Concentration in (mg/L)	CS15	01/26/05	13:00	4.998
Concentration in (mg/L)	CS15	01/26/05	13:03	5.286
RPD				6
Concentration in (mg/L)	FT16	1/30/2005	8:40	2.761
Concentration in (mg/L)	FT16	1/30/2005	8:43	2.870
RPD				4
Concentration in (mg/L)	D03	1/29/2005	14:30	8.781
Concentration in (mg/L)	D03	1/29/2005	14:33	10.892
RPD				21
Concentration in (mg/L)	CS07	01/28/05	12:20	0.795
Concentration in (mg/L)	CS07	01/28/05	12:23	0.696
RPD				13
Concentration in (mg/L)	NSJ32	01/28/05	12:30	6.899
Concentration in (mg/L)	NSJ32	01/28/05	12:33	6.944
RPD				1
Concentration in (mg/L)	NSJ28	02/01/05	13:00	4.673
Concentration in (mg/L)	NSJ28	02/01/05	13:03	4.831
RPD				3
Concentration in (mg/L)	SSJ12	02/04/05	11:50	3.851
Concentration in (mg/L)	SSJ12	02/04/05	11:53	3.873
RPD				1
Concentration in (mg/L)	NSJ31	2/16/2005	9:50	3.800
Concentration in (mg/L)	NSJ31	2/16/2005	9:53	3.884
RPD				2
Concentration in (mg/L)	NS04	2/16/2005	12:10	2.604
Concentration in (mg/L)	NS04	2/16/2005	12:13	2.321
RPD				11
<b>Field Blanks</b>				
Concentration in (mg/L)	FT03	01/27/05	11:21	0.302
Concentration in (mg/L)	CS07	01/27/05	12:21	0.376
Concentration in (mg/L)	FT14	1/30/2005	13:01	0.341
Concentration in (mg/L)	D01	01/28/05	10:41	0.649
Concentration in (mg/L)	SSJ03	02/01/05	10:31	0.699
Concentration in (mg/L)	D02	02/03/05	11:31	1.006
Concentration in (mg/L)	D03	02/15/05	13:21	0.592
DL = 0.5mg/L / RS = 1mg/L				

**Table 27. Summary of Metal Field QA / QC data for the Irrigation Season 2004 (in µg/L)**

	Site ID	Collection Date	Collection Time	As	B	Cd	Cu	Ni	P	Pb	Se	Zn	
<b>Field Duplicates</b>													
Concentration in ppb (µg/L)	FT14	07/20/04	11:40	2.37	38.0	0.05	5.93	2.23	64.1	0.81	0.36	6.19	
Concentration in ppb (µg/L)	FT14	07/20/04	11:43	0.18 a	2.41	-0.01	-0.003	-0.01	-1.00	-0.002	0.26 a	-0.02	
RPD					176*								
Concentration in ppb (µg/L)	DO2	07/21/04	9:40	5.69	475	0.10	10.9	11.0	677	2.51	3.48	19.2	
Concentration in ppb (µg/L)	DO2	07/21/04	9:43	5.73	473	0.09	9.24	8.98	638	1.90	3.51	15.1	
RPD				0.7	0.4	11	16	20	6	28*	0.9	24	
Concentration in ppb (µg/L)	CS15	07/26/04	12:20	1.28	36.5	0.05	17.4	11.5	189	2.08	0.32	14.2	
Concentration in ppb (µg/L)	CS15	07/26/04	12:23	1.29	28.8	0.02	12.1	5.01	134	0.79	0.13 a	6.25	
RPD				0.8	24	86*	36*	79*	34*	90*		78*	
Concentration in ppb (µg/L)	CS09	07/27/04	12:50	1.53	26.2	0.02	3.57	3.82	79.4	0.52	-0.10	3.04	
Concentration in ppb (µg/L)	CS09	07/27/04	12:53	1.55	25.1	0.03	3.81	4.06	82.7	0.57	-0.10	3.38	
RPD				1.3	4	40*	7	6	4	9		11	
Concentration in ppb (µg/L)	SSJ08	07/29/04	9:50	7.95	215	0.12	9.66	10.2	487	3.56	1.75	25.8	
Concentration in ppb (µg/L)	SSJ08	07/29/04	9:53	7.89	213	0.11	9.44	9.85	478	3.48	1.96	28.9	
RPD				0.8	0.9	9	2	3	2	2	11	11	
Concentration in ppb (µg/L)	SS07	08/05/04	12:10	3.23	926	-0.010	1.30	3.12	84.4	0.118	0.370	0.878	
Concentration in ppb (µg/L)	SS07	08/05/04	12:13	3.21	930	-0.010	1.34	3.35	85.8	0.116	0.301	0.857	
RPD				0.6	0.4		3	7	2	2		2	
Concentration in ppb (µg/L)	NSJ28	09/08/04	9:30	0.763	12.6	0.024	2.56	0.639	58.8	1.87	0.148	9.24	
Concentration in ppb (µg/L)	NSJ28	09/08/04	9:33	0.766	12.3	0.024	2.50	0.566	55.7	1.79	0.128	8.84	
RPD				0.4	2		2	12	5	4		4	
<b>Field Blanks</b>													
Concentration in ppb (µg/L)	NSJ29	07/15/04	12:11	-0.10	19.6**	-0.01	0.03**	0.03**	-1.00	0.02**	-0.10	6.12**	Travel Blank
Concentration in ppb (µg/L)	FT13	08/02/04	8:01	-0.10	17.8**	-0.01	0.22**	0.81**	-1.00	-0.002	-0.10	12**	Field Blank
Concentration in ppb (µg/L)	NS07	08/12/04	11:31	-0.100	1.52	-0.010	0.017	-0.010	-2.00	-0.010	-0.100	-0.100	Travel Blank
Concentration in ppb (µg/L)	NSJ03	08/11/04	11:21	-0.100	33.8**	-0.010	0.074**	0.057**	-2.00	-0.010	-0.100	40.3**	Field Blank
Concentration in ppb (µg/L)	CS21	08/24/04	8:51	-0.100	16.7**	-0.010	-0.010	-0.010	-2.00	-0.010	0.109	6.06	Field Blank
Concentration in ppb (µg/L)	NS07	09/16/04	11:41	-0.10	0.4**	-0.01	-0.01	-0.01	-2.00	-0.01	-0.40	-0.10	Travel Blank

a: value between the MDL and RL

Values below the MDL are reported as negative the MDL (ie -0.01 for Cd)

\*FDP-field duplicate RPD above QC limit

\*\* IP- analyte detected in method, trip or equipment blank

**Table 28. Summary of Metal Field QA / QC data for the Dormant Season 2004 / 2005 (in µg/L)**

	Site ID	Collection Date	Collection Time	Arsenic	Boron	Cadmium	Copper	Lead	Nickel	Phosphorus	Selenium	Zinc	
<b>Field Duplicates</b>													
Concentration in ppb (µg/L)	CS15	17/Feb/2005	7:50	2.19	277	0.02	6.44	0.71	6.71	153	2.55	6.85	
Concentration in ppb (µg/L)	CS15	17/Feb/2005	7:53	2.21	292	0.02	6.38	0.69	6.43	150	2.73	6.55	
RPD				1	5		1	3	4	2	7	4	
Concentration in ppb (µg/L)	D01	26/Jan/2005	17:50	3.57	324	0.09	11.3	3.75	12.5	666	1.10	32.1	
Concentration in ppb (µg/L)	D01	26/Jan/2005	17:53	2.12	83.2	0.10	12.9	4.32	13.8	467	0.53	41.5	
RPD				51*	118*	11	13	14	10	35*	70*	26*	
Concentration in ppb (µg/L)	D02	03/Feb/2005	11:30	3.31	477	0.04	5.32	0.32	7.71	203	5.08	5.47	
Concentration in ppb (µg/L)	D02	03/Feb/2005	11:33	3.16	480	0.04	4.65	0.17	7.50	202	4.75	4.39	
RPD				5	1	0	13	61*	3	0	7	22	
Concentration in ppb (µg/L)	NSJ28	30/Jan/2005	10:00	1.09	55.9	0.04	4.52	1.98	1.26	116	0.19	35.1	
Concentration in ppb (µg/L)	NSJ28	30/Jan/2005	10:03	1.25	55.9	0.04	4.36	2.13	0.52	119	0.44	34.7	
RPD				14	0	0	4	7	83*	3		1	
<b>Field Blanks</b>													
Concentration in ppb (µg/L)	CS15	31/Jan/2005	8:41	-0.10	26.9**	-0.01	0.17**	-0.01	0.1**	6.4**	0.17	4.09**	Field Blank
Concentration in ppb (µg/L)	NSJ28	16/Feb/2005	10:51	-0.10	8.7**	-0.01	0.15**	0.01	-0.01	-2.00	0.15	-0.1	Travel Blank
Concentration in ppb (µg/L)	SSJ12	29/Jan/2005	10:31	-0.10	21.8**	-0.01	0.04**	-0.01	0.06**	7.94**	0.10	2.75**	Field Blank
<b>Acidifaction Blanks</b>													
Concentration in ppb (µg/L)		27/Jan/2005	09:20	0.13	3.8**	-0.01	0.04**	-0.01	-0.01	-2.00	0.29	4.39**	
Concentration in ppb (µg/L)		28/Jan/2005	09:00	-0.10	3.4**	0.03**	0.17**	0.03**	0.2**	-2.00	0.25	3.56**	
Concentration in ppb (µg/L)		29/Jan/2005	10:00	0.12	31.8**	-0.01	0.02	-0.01	-0.01	-2.00	0.18	22.1**	
Concentration in ppb (µg/L)		30/Jan/2005	08:30	-0.10	31.5**	-0.01	0.15**	-0.01	0.07**	13.7**	-0.10	3.14**	
MDL				0.1	0.04	0.01	0.01	0.01	0.01	2.00	0.1	0.10	
RL				0.5	0.20	0.03	0.03	0.03	0.05	6.00	0.5	0.30	

Values below the MDL are reported as negative the MDL (ie -0.01 for Cd)

\*FDP - field duplicate RPD above QC limit

\*\*IP - analyte detected in method, trip or equipment blank